The Builder.

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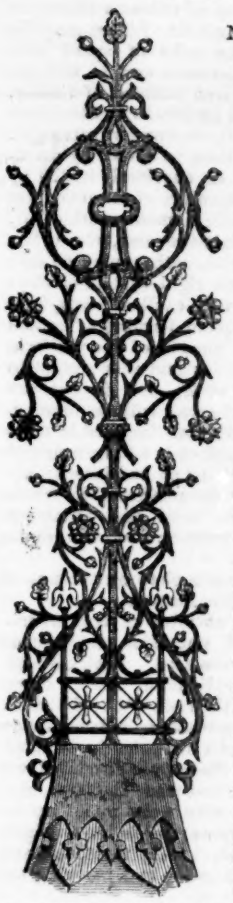
The Thames Embankment.



IN describing the work of the Thames Embankment of the Middlesex side, we shall find convenience in dividing it, after the manner of the engineer in specifying the sewerage, into general and "special" construction. The first division will include the river-wall from Westminster to Whitefriars, —of one design throughout, or excepting where the *special construction* occurs, and now in progress, — and also the portion of the Low-level Sewer, the subway and the roadway, of the same length; the latter will include the steam-boat pier at Westminster Bridge, the two steam-boat piers at the Charing-Cross Railway Bridge, the two at Waterloo Bridge, which were shown in our view last week; the pier and landing-stairs near the Temple; the "York Gate" landing stairs opposite Whitehall Gardens, the stairs opposite Salisbury-street, the work for the maintenance of Waterloo Bridge; that for the outlets of the Victoria, Regent-street, Northumberland-street, Savoy-street, and Essex-street sewers, or storm-water outfalls; the junction of the Northumberland and Craven-street sewers; the different chambers, weirs, penstocks, and flaps; sewers of interception (almost as long as the sewer in the Embankment); work to the minor sewers and drains now discharging landward of the line of Embankment, which are something near fifty in number about the Temple alone; and the details of sewer-entrances and ventilating-shafts. Of one great division of the special construction, that just referred to, which is connected with the old sewers, some idea may now be gained on looking from the end of Norfolk-street, or the present Temple Pier, at the heavy work which is in progress between tides. Here also, the best idea may be formed of the earthwork of the Embankment, which is far advanced. It has been the cause of serious obstruction to the traffic of Fleet-street, but will materially aid the contractor's operations connected with the old sewers, by keeping out the tide. Still reserving notice, further than was given in our review of drawings in the Exhibition of the Royal Academy, of the decorative features of the piers and stairs, and description of much of the special construction, we proceed with our account of the works of the general division. Since the first stone was laid, the main intercepting, or Low-level, sewer has been commenced; but, necessarily as yet, the portion of the work is confined to the bit of the length of the Embankment, where the coffer-dam was constructed for the purpose of laying the stone. The general coffer-dam arrangement in the length of Mr. Furness's contract (for which Mr. T. Lovick is the resident engineer), will be different to this special construction, and less costly. We publish this week, a plan and section showing the special construction, as well as the river-wall, sewer, and subway, and serving also towards the explanation which we shall give of the general construction of the coffer-dam, or dams, in the length between Westminster Bridge and Somerset House.* In the plan, a portion of the return of one of the sides is broken off, our page not being large enough; and it must be distinctly understood that the old method of coffer-dam construction with a double row of sheet-piling and clay-puddle is, as to Mr. Furness's contract, confined to the one spot where there was a particular purpose to be served; though the new and more economic system makes use of the iron caissons in the line, on plan, in which we have shown them.

Before deciding upon the precise structure of the permanent Embankment, and the appliances which might be available in the work, it was necessary to consider the soil and substrata of the Thames. The deepening of the river-bed, commencing after the removal of old London Bridge; the failure of old Westminster Bridge and Blackfriars Bridge, from this cause; a certain apprehension as to Waterloo Bridge, and the expectation of an increased scour after embankment, have pointed to the necessity in all future structures on the Thames, for foundations laid at considerable depth. There has been some difference of opinion as to the necessity for going down to the London clay; and it has not always been clear at what depth the clay would be met with. Mr. Brunel, for the piers of Hungerford Bridge, which are at present the brick piers of the Charing-cross Railway bridge, chose to build upon the gravel; whilst Mr. Page, by a peculiar method of construction, in the case of new Westminster Bridge, may be said to have founded his piers partly on the gravel, and partly in the clay. Prior to the completion of the Westminster Bridge, certain referees of the Government, had reported strongly in favour of foundations in the clay, at whatever inconvenience and cost of a coffer-dam of the old form, which was adopted by Mr. Brunel in Hungerford Bridge; and was even used, by Mr. Fowler, more recently, in the case of the bridge for the Victoria Station and Crystal Palace Railway.

Mr. Bazalgette, however, has been served by inventions which have been attentively watched in these pages; he was able to decide upon dispensing with coffer-dam construction of the kind used on the building of the Houses of Parliament; and his work, or that of the contractors, has been further served by inventions of the last few months. At the commencement of last year, indeed, as shown by a report to the Metropolitan Board, he was able to decide upon a system of excavating within a "connected line of iron caissons," which were to be sunk below the bed of the river, to be filled with Portland cement concrete to within 6 ft. of low-water level, and to be otherwise "so constructed as to form a full tide dam." The work was to "be carried on in short lengths, so that the upper portion of the dam above low-water" could be removed on the completion of each length, and used in the formation of the one adjoining. The particular caisson now used in Mr. Furness's contract is the invention of a different engineer; but the date and authorship of the original suggestion seem to have been forgotten. At the date to which we have referred, Mr. Bazalgette was of opinion that a sufficient foundation could be obtained "upon the lower portion of the bed of gravel, at a depth of about 14 ft. below low-water mark, and 10 ft. above the London clay," which he said was "reached at a depth of about 42 ft. below Trinity High-water Mark," the gravel above "averaging from about 15 ft. to 25 ft. in thickness," and varying in coarseness and character, and the river-mud and sand averaging about 7 ft. We have some difficulty in exactly reconciling this information, said to be derived from the thirteen borings which had been made, with the sections given with the contract drawings, and each with experience in the works as it has been stated to us. However, at the starting-point near Whitehall Stairs, all the observations of facts seem to have been accordant; whilst, though perhaps exceptionally, the concrete foundation is there in the London clay.

Impermeability, as that of clay, or even of some portion of the Thames mud, constitutes a great advantage in sinking cylinders or caissons, safely and economically. The original method, introduced in France by Triger; subsequently used in the construction of Rochester Bridge, and afterwards with improvements and simplifications, for the piers of the Rhine Bridge, at Kehl, and the bridge at Argenteuil, near Paris, was the compressed-air system, or that of the diving-bell. We gave particular attention to it in 1862, in one of our articles on the Exhibition of that year. In sinking the cylinders for the Charing-Cross Railway Bridge, the compressed-air system was dispensed with; and the cylinders were sunk by the aid of divers, working inside, until such time as the cylinder had reached the clay, when it could be pumped dry, and the work be continued with comparative ease. In subsequent works, as Lambeth Suspension Bridge, the Railway Bridge at Blackfriars, and the bridge to the Cannon-street station of the Charing-Cross Railway, the compressed-air system has in like manner been unnecessary. In the last case, divers have not been employed; and the material from within the cylinders has been raised most economically by dredging. In the construction of the Cannon-street bridge, also, the weakness of the square form of caisson used in the abutments, as compared with the circular form used for the piers in the river, was established. Each of these matters of experience prior to the commencement of the Thames Embankment, has proved of much value. It was especially advantageous to be in the position to apply cylinder construction,—or that which is the actual construction, and which differs from the cylindrical only in form, and in the introduction of a method of junction,—and to have at once a water-tight enclosure, and the means of depositing concrete in the caissons, as well as at the back of the wall, on the dry bed. Portland cement concrete will of course set under water; and for the foundations of Westminster Bridge, the material was deposited without pumping out the water, as it was at first in the case of the work of the Embankment. But there may be some advantage in cases where the concrete has to fill a particular space, in seeing that the space is filled. Therefore, as the water can be pumped out of the caissons, the practice now is to lay the concrete on the dry bed. Even though the cutting-edge of the cylinder, or caisson, may not have got down to the clay, the mud on the bed of the river is found to act as a lute, or like a leather washer, and to prevent the water from getting down to the bottom of the caisson, and rising within it.

It is time, however, to describe the form and dimensions of the permanent work, and the actual construction of the coffer-dam. And first of what will be permanent. Our section shows this, as well as the caissons forming the front of the general coffer-dam construction, and also the special coffer-dam construction in the single case of the spot near Whitehall Stairs. The permanent work includes not only the retaining-wall, sewer, and sub-way, and their foundation as shown, but the lower portion of the caissons; which last, filled with concrete, becomes an effi-

* See p. 582.

cient fender to the toe of the wall. This last-mentioned arrangement, and that of these iron caissons generally, has not been adopted up to the present time in the work in Mr. Ritson's contract, extending to Whitefriars, as will be shortly explained. Mr. E. Cooper is the resident engineer for this second contract.

The foundations of the river-wall were specified as to be carried down to 20 ft., at the least, below Ordnance datum, that is 32 ft. 6 in. below Trinity high-water level, or 14 ft. below low-water level. From that level, or the additional depth that might be required, the trenches were to be filled with concrete to 12 ft. 6 in. or thereabouts, below the datum (that is, to 6 ft. 6 in. below low-water level); and a bed was to be dressed to the proper slope and level for the footings of the brick wall. The recommendation of the Commission of 1861, as to an uniform low-water channel of 6 ft. in depth at ordinary spring-tides, is not followed. In the lower part of its course, or from Whitefriars to the Victoria-street sewer, which is just above the Charing Cross Railway Bridge, the Low-level sewer is to be 8 ft. 3 in. in clear diameter, and to be formed in brickwork of 13½ in. thick. To Westminster-bridge it is to be 7 ft. 9 in. in the clear. At the western extremity of Mr. Ritson's contract, the invert of the sewer will be, at the lowest part, 6 ft. 3 in. below Ordnance datum. The fall will be that generally adopted as the minimum, 1 in 2,640, or 2 ft. per mile. The sub-way will be over the sewer, with an interval of about 4 ft., and it will be 9 ft. in width, and 7 ft. 6 in. in height to the crown of the arch, and 3 ft. in the straight sides. The crown will be 2 ft. 1½ in. below the surface of the footway, which surface is 4 ft. above high-water line. The floor of the sub-way, to be gravelled, is to be about 5 ft. 6 in. below high-water, and is to be on a level, excepting where it crosses certain overflow-chambers near to Waterloo-bridge.

Besides the backing of brickwork to the masonry, as shown, there are 18-inch counter-forts of brickwork specified, intersecting the whole construction, six feet apart; the spaces left about the sewer and subway being filled with concrete. And there is an alternative method of construction, shewn in the drawings, wherein there is no backing of brickwork, the entire space being filled by concrete; which would be some of it in blocks.

A counterfort, 3 ft. thick, will be built over the arch of the sub-way at the back of each of the lamp-pedestals to receive the washer of a long mooring-bar which passes through the whole construction, and is attached to the mooring-rings upon the pedestals. Each ring, which is of cast and hammered gun-metal, will appear as held in a lion's mouth. There will be 58 of the lamp-pedestals and mooring-rings, besides those at the steamboat piers and landings.

The river-wall will be faced with granite, to a curved batter, from 2 ft. below low-water mark to about 1 ft. 6 in. below high-water mark, where there will be a chamfered plinth and surbace-mouldings, to a plain face of about 2 ft., forming the sub-plinth to the parapet, which will be formed with regular dado, plinth-mouldings, and cornice, projecting however but slightly on the inner face. The surbace-mouldings start from high-water level, as well as the block-pedestals for the lamps, by which the horizontal lines above the chamfer are cut. The parapet will be formed as a balustrade only where steam-boat piers and landing-stairs occur. Particular and judicious directions are given as to the masonry; which will contribute to the decorative effect. Joints are not to exceed one-eighth of an inch in thickness. The stones of the parapet, and those above a given level, are to be dowelled together in beds and joints with slate dowels each 2½ in. square.

Similar precise directions are given as to other divisions of the work, and for testing the materials. They may be suggestive as precedents.

The cement used is all to be Portland, ground extremely fine, and weighing not less than 112 lb. to the imperial (striked) bushel. It is to be brought on the works fit for use, and is not to be used until it has been on the ground three weeks at least, nor until tested, samples being taken out of every tenth sack, gauging the samples in moulds, and by apparatus similar to that heretofore used by the Board, placing the cement at once in water, in which it is to remain for seven clear days, and testing it at the end of that time by application of a weight. All cement that does not bear without breaking, 500 lb., is to be rejected. Lime that may be required is to be blue lias, from the lower beds, equal to Aberthaw, fresh from the kiln, and ground on the works in mills under edge-runners.

The concrete is to be formed of one measure of Portland cement to six measures of ballast, for the foundation works, and one of cement to eight of ballast for other works. The mixing is to be done by machines, generally: should any be allowed by hand, only six of ballast must be used. And should lime be used, one measure of it to six measures of ballast will be required. If concrete in blocks be required in place of the brickwork, there are to be seven measures of ballast to the one of Portland cement. But no such blocks are to be used till they shall have been made for three months.

The cast-iron is to be the best grey cold-blast pig-iron, free from cinder, mixed with one-fifth of best scrap-iron, and re-melted in the cupola. Bars, 2 in. deep and 1 in. broad, are to be cast for testing; and, placed on supports 3 ft. apart, are to bear without breaking 3,200 lb. in the centre. The wrought-iron, the best Staffordshire, is to bear 22 tons per square inch. Castings and wrought-iron are to be delivered free from paint; and all iron so sent, or with plugging in any part, will be rejected.

Sums amounting to 30,000*l.*, for ornamental figures and lamp-standards, are included in the contracts, as well as 22,500 cubic yards of extra Portland cement concrete, and similar items, and besides 75,000*l.* for meeting expenses of extra works not included in the specifications.

Relative to the ballast, or like material, for the backing of the Embankment, the specification in each case, says that if the contractor does not obtain the material "by the means aforesaid" (that is from the Conservators of the Thames, directly, or through the Board, or by raising the ballast himself from the river on the order of the Board), he shall obtain proper materials from other sources.

On delivering up the works, he is to return all drawings and documents before receiving the instalment payable; and the engineer and his assistants are to have always access to such documents.

As to the adjustment of claims for extras, the contractor is, within seven days after the signing of the contract, to deliver to the engineer full and true bills of quantities, with the rates and amounts of each item, or to incur a forfeit of 10*l.* for each day's delay; and, as to day-work, a precise account is to be kept, with the names of the workmen; and the account is to be given in daily,—the engineer, however, having power to decide whether the work is extra, and not capable of measurement. The contract is not to be assigned, or underlet; or there is to be a forfeit of 20,000*l.* There are numerous other conditions, bringing each contract to near a hundred clauses. The larger contract is to be completed in two years and six months, and the eastern contract in two years, from the time of commencement; or one per cent. on the amount of tender is to be deducted for each week's delay; though an exception is made as to strikes. A lengthy schedule of prices forms part of each document. In the day-labour, bricklayers, masons, carpenters, and smiths, are set down at 6s. 6d., excavators at 4s. 6d. or 4s., and labourers at 3s. 9d.

All mud and deposit from the foreshore, between the new line and the existing river-walls, is to be removed, as may have been understood; and the filling in with ballast, or other material, is to be brought to levels varying from 15 ft. above Ordnance datum, for a width of 120 ft. at the back of the line, to 13½ ft. for the remainder of the width.

As regards the system of coffer-dam, each specification said that the Embankment-wall was "to be formed with iron caissons, or coffer-dams,"—the latter expression doubtless referring to the old kind of construction,—as the engineer might direct; but, actually, each contractor has been allowed to adopt his own system, subject only to the original stipulation that "should caissons be adopted," "the backs and fronts" thereof were to be left in the ground, up to a level of 8 ft. below datum; and that should coffer-dams be adopted, the whole of the piles were to be cut off to a level which was to be pointed out,—and so, we may suppose, as to produce the same effect as that anticipated from the protection in the other case, by the caissons where filled with concrete as shown in our section. Mr. Ritson adopted the old system, and has used it for a considerable portion of the work, as may be seen. In driving piles through the bed of the Thames, however, cement-stones are apt to be met with; and the shoes of the piles get broken, and the timber blunted. Sometimes where, as supposed, there are no stones, and in case of piles that have had to be drawn for the purpose of driving afresh, the piles are found with the shoes broken off by the tenacity of the clay. These difficulties may not be important where piles are at considerable distances, as for staging for travelling-cranes; but, in the case of sheet-piling, they are very important, as increasing delay and expense. Mr. Furness has therefore adopted the arrangement of caissons shown in our plan and section; and Mr. Ritson may be at last obliged, for the sake of speed and economy, to adopt not the same system, but one equally making use of iron instead of timber. To this system, patented by Mr. R. P. Stockman and Mr. J. Sheppard Scott, we may give attention.

But we may mention that, as shown by drawings now before us, and as succinctly stated by one of the patentees, the nature of the invention is to sink cylinders, 8 ft. diameter with 10 ft. spaces between them, into the clay, the cylinders to be filled up, solid, with concrete; and upon them a massive and rigid system of cast-iron girders and plates, with caulked joints, is to be lowered in place complete, forming a "sealed platform." Round the margin of the platform there will be vertical sides and ends similar to those of an ordinary tank; and in the dry chamber thus formed the wall will be erected. When the portion of the wall inclosed is completed, the tank-sides and ends will be removed and the wall remain, founded on and inseparably connected with the massive platform, the whole being supported by the solid and numerous pillars of concrete in cylinders sunken down into the clay.

We have here only to complete an account of the system adopted by Mr. Furness.

It has been arrived at after several experiments. In one method, put aside, caissons of oblong shape on plan, were used. Each division was cast with a hemicylindrical indent down each end; so that when the ends of two divisions were brought together, a whole cylindrical space was formed; and this was intended to be filled with clay-puddle. Why these were discarded, we are not aware exactly; but from the form, and the manner in which they were made up in pieces, they were greatly wanting in the strength of the caissons adopted, which, moreover, are most conveniently fitted end to end, carrying on a line of them.

These latter caissons were contrived by Mr. Joseph Phillips, of Messrs. Cochrane's establishment, who has had the management of the sinking of the cylinders for the Charing-Cross Railway Bridge and the Cannon Street Station Bridge. They have an elliptical shape on plan, are 12 ft. 6 in. by 7 ft. outside measurement, and have a groove 6 in. in width and depth at each end. This groove, along with a similar one in the butted end of the next caisson, is to receive the timber pile which forms one of the guides to the descent of the caissons, as well as a joint, water-tight with packing. Each caisson is built in divisions of 4 ft. 6 in. in height; which are of wrought-and-rivetted boiler-plate iron, where to be below the bed of the river, and there left in, and of cast-iron, where above and intended merely to serve the purpose of the coffer-dam. There is necessarily a "cutting-edge" at the bottom of the pile or stack: but the other joints of the caisson are formed with angle-iron, or flanges; so that the divisions can be screwed together, inside, and with a packing of felt and tar to the joint, can be made water-tight. The thickness of the metal is ¼-in., or 3-8ths; and the angle-iron is 5 in. by 3 in. by 5-8ths of an inch. The grooved portion of each of the lower or permanent caissons was, at first, made of cast-iron: but now, plate-iron is bent to the shape; so that, the whole of the division is of one material, as just now explained.

Before building up and sinking the caissons, the line of the face of the embankment is first got approximately, but with sufficient accuracy for the coffer-dam construction we are describing. About the middle of the length from one bridge to another, a point is fixed in the rear of the general line of staging, and marked by a pole or wand, set up on a small staging erected for the special purpose. The lines from this point, to two points on the bridges, form a large angle, in which the principal curve, which is of 9,000 ft. radius, is found by offsets. These are taken every 50 ft., that is to say, at the end of every length of four caissons. With the aid of the staging and travellers, partly shown in our illustration, the end guide-piles are

driven, as well as four others at the sides of the space which will be filled by the caisson. Whilst this is going on, the lower divisions of the caissons are being bolted together. These are then raised by the steam-crane, and dropped into the intended position on the river-bed, being guided by the piles. The end-pile is driven below the bottom of the caisson, which sinks slightly into the mud or soil by its own weight; and this pile is kept driven in advance of the sinking, so as to form a perfect guide. The caissons are then weighted at the top, and inside on the flanges, by numerous blocks of iron, each of which fits the curve of the ellipse. The materials of the strata, when not too hard, are scooped out of the inside of the caisson by the common contrivance called the "bag and spoon," which is used by ballast-heavers. It is simply a bag made of thick leather, and attached to a scooping-edge and a strong frame-work of iron. This "spoon" is drawn along by a chain, and guided by a strong pole, placed as the handle of the "spoon." In other cases, a common dredging-machine with the buckets working perpendicularly is used. A modification of the usual form of bucket has been made by Mr. Slater, one of the assistants of Mr. Furness. This bucket has a species of "false bottom," which is moved as the bucket is delivering its contents; whereby there is no sticking, and no duty of the machine lost. The improved machine to which we are referring, also includes an arrangement for lengthening, telescope-fashion, the stretch between the centres of revolution, or points of filling and delivery of the buckets. Much information on dredging machinery, and other contrivances, may be found in the "Recueil d'Appareils à Vapeur employés aux travaux de Navigation et de Chemins de Fer" of Mons. A. Castor, a work already noticed in these pages as containing illustrations of the method of putting in the foundations of the Kehl and Argenteuil bridges.

The dredging contrivance, whichever it may have been necessary to adopt, scoops up the gravel or other material from the middle of the elliptical space; the material from the sides keeps falling in; and the weight causes the caisson to sink. Any fresh lengths of the caisson are built on to make up the height required. As soon as the clay is entered, or even when the mud has been passed through, the caisson can be pumped dry. Murray's chain-pumps are used. By a simple contrivance, weight can be taken off at the moment when the caisson shall have sunk to the proper depth. Thus the top of the permanent work at the toe of the retaining-wall, will be everywhere level, without an additional division having had to be sunk to make up for descent of the lower divisions farther than the intended levels of the three to be filled with Portland cement concrete, in the manner already referred to, and as they are shown in our section. The labour of putting together and sinking one of these caissons, it has been found, occupies a week.

So far, here, we have only got the explanation of the frontage of the great area to be reclaimed, or appropriated to the retaining-wall and the other permanent works described, and of which area the greater part is still covered with water at every tide. It must be recollected however, that the area is at present being reduced by the large quantities of material which are daily being tipped; and shortly, even at high-water, there may be little more to be dealt with than the width of the construction shown in our section. Towards such period, convenient lengths of say 100 or 200 ft. of the line, will be inclosed by return-ends, either of ordinary coffer-dam construction, or as the contractor may find best. Indeed, it is thought that a single row of sheet-piling might answer, with the earth thrown against it. However this might be, the inclosure being complete, the tidal water would be allowed to flow out; and then the large area would be kept dry as an ordinary coffer-dam; and the foundation for the wall would be laid on the dried ground. Some method of sheet-piling however, parallel with the line of caissons, would be necessary for the support of the concrete backing; and brick counterforts on the land side, which are not shown on the drawings, would seem to be called for. It has been suggested that the particular construction adopted, allows no means of escape for the land-water which at present filtrates to the river; and that there may in that particular be advantages in the system, the old one, of timber piles, as adopted by Mr. Ritson; albeit the advantages of the solid protection to the toe of the wall in the other case are obvious.

On the completion of such length as we have referred to, of the wall, the upper divisions of the caissons,—those which are of *cast* iron, and not filled with concrete,—will be removed, and will be serviceable in another similar length of the work.

The coffer-dam construction, the backing to the wall, and the intercepting sewerage, are now making very active progress: about a month ago, Mr. Bazalgette's report stated that there were twenty-five steam-engines at work on one length, that contracted for by Mr. Furness, and seven steam-engines on the other; but after the years of discussion, it becomes almost surprising to see how rapidly the Embankment can be realized.

THE BASILICA OF ST. LAWRENCE, ROME.

The restorations, begun in the winter of '63-4, at the extramural basilica of *S. Lorenzo*, recall our attention to that fine old church, belonging to so many different periods, and connected with so many legendary as well as historic traditions. It is gratifying to learn that the project of the architect, Count Vespignani, is to renovate this edifice in a style in harmony with its older characteristics, throughout the details of the work entrusted to him, not to admit any new *norma* in the designs to be here carried out. If this intention, as officially stated, be really acted upon, the result will prove a happy exception to the generality of public works, where the antique has been, one cannot say *restored*, but rather disguised by modern undertakings in Rome. The architecture of recent growth within this city displays an incapacity to understand or feel the spirit of the Middle Ages; and in the metropolis of the church we have constantly to regret the ignoring of that which is noblest in the artistic expression, in the splendid external developments of Catholicism. The showy edifice, more Pagan than Christian, built for funeral rites in the centre of the great Cemetery (within late years much enlarged) adjacent to the above-named basilica, is an example of this. Another (still less excusable) is the Greek façade (by the architect, Guglielmutti) more like a club-house than anything sacred, thrown up before *S. Salvatore in Tauro*, a church of the fifteenth century, with unscrupulous sacrifice of a fine old façade, dating 1450, whose marble portal, with clustering pilasters, and *couchant* lions guarding the entrance at each side, were swept away, a few years ago, as so much useless material. Not long before the publication of the admirable *Beschreibung* (1836), by Bunsen and other German *savans*, the Mediæval cloisters of *S. Saba*, on the Aventine, were despoiled of their spiral and fluted marble colonnettes, resembling those in the cloisters of St. Paul's and the Lateran, to be replaced by supporters of wood! But it is vain to multiply the examples of what is manifest around us in the course of our studies of sacred antiquity at Rome, wherever we turn.

S. Lorenzo received its nucleus from an oratory built by Constantine over the tomb of the martyr St. Lawrence, in those catacombs excavated below this church which are mentioned by Prudentius in his hymn to the honour of St. Hippolytus. After this chapel had been embellished by different popes, and perhaps rebuilt by the Emperor Theodosius, it gave place to a stately basilica raised by Pelagius II. towards the end of the sixth century. At a later period, another pope, Adrian I. (as conjectured in the year 792), so enlarged this, that the earlier became the tribune or choir of the later church; and about the beginning of the thirteenth century a general restoration was effected, with new façade and portico, by Honorius IV. The actual building proves, as is observed by Bunsen, more perplexing than any other of Rome's churches; for though the point of separation between old and new (the sixth and thirteenth centuries), is sufficiently marked by the chancel arch, the architectural lines of the different sections do not correspond; and much alteration has been caused by the fatal interferences of modern restorers. On a frieze over the Ionic columns of the portico, is exemplified the manifest decline of mosaic art in some small figures, belonging to the time of Honorius III., representing the Saviour between St. Lawrence and a mitred prelate, probably that pontiff himself. Round the walls of this portico, and on the corresponding side of the nave internally, extends a most curious series of frescoes, representing the histories of St. Stephen and St. Lawrence, the coronation performed in this church by Pope Honorius of Peter de Courtenay, Count of Auxerre, and his wife, as Emperor and Empress of Constantinople; the communion of that Emperor from the hand of the Pope; and other legendary subjects. The tribune is the finest part of the interior; and its double colonnade of fluted pillars in Phrygian *pavonazzetto*, a magnificent example of the spoils applied from Pagan to the adornment of Christian edifices. We are here in the ancient church of Pelagius II., which, Ciampini supposes, had its entrance at what now forms the eastern extremity of the church, between two superb Corinthian columns still erect behind an episcopal throne and screen-work richly inlaid with coloured marbles; but Bunsen shows that, owing to the slope of the hill, cut away on this side for giving place to the buildings below, such could not have been the original plan. Over the chancel-arch, on the inner side, are the interesting, but much-injured mosaics of the sixth century, partly restored in indifferent painting: the Saviour, of youthful, but stern aspect, seated on a globe; to His right SS. Peter and Lawrence, and Pope Pelagius holding a model of this church; to His left, SS. Paul, Stephen, and Hippolytus, each holding either a book or a crown,—earliest symbol of martyrdom; the costumes, simple and classic; St. Peter distinguished by a wand (symbol of authority) in his hand; as also in that of the Saviour is held the wand implying distinct assertion of power and dignity. At the extremities of the two groups are the mystic cities, Jerusalem and Bethlehem, their names inscribed, as all these figures likewise have written names.

Most interesting, among other artistic objects in this church, are the two lofty ambones, opposite each other at about the centre of the nave, both alike rich in inlaid marbles, porphyry and serpentine,—perhaps the finest specimens of such Mediæval decorative work that Rome's sacred buildings contain. In other respects this interior is characterised by all the sombre severity and massive simplicity of forms peculiar to the early basilica. It impresses by attributes of antique, but somewhat sterile dignity; and the dim light admitted through narrow-arched windows, opening in the high attic above long lines of architrave, enhances the effect of the gravely harmonious *ensemble*. Whether this primitive character will be preserved intact by the restorers now engaged here, we may well doubt; nor do all details, in what is already complete, bear satisfactory promises,—for instance, the building up of several of those old windows, with concealment of their plain but curious tracery, and opening of others, much wider, in the intervals between them.

Under the high altar, in the dim-lit confessional, repose the relics of St. Stephen and St. Lawrence; the former first brought from Jerusalem to Constantinople by the Empress Eudocia, in 439; and, about 557, obtained by a Papal legate for Rome. Legends state that when the body of the protomartyr was laid beside that of St. Lawrence in this shrine, the latter moved to one side, giving place to so venerable a companion in death; also, that when this shrine was opened during the progress of the buildings of the sixth century, by workmen who unexpectedly found it after the precise spot had long been forgotten, all were punished for the unconscious sacrilege by death within ten days following, though none had dared even to look upon that sacred treasure. The antique church had been in the greater part filled up to form a solid foundation to the actual choir, elevated considerably above the nave; and from this higher level we look down to the bases of the classic columns that rise from the pavement of the earlier building, in that portion left for centuries useless. It is the best object proposed in the restorations now progressing, to clear out this lower and most venerable sanctuary around the shrine where the two martyrs repose, and give it back to the purposes of public worship.

Considering monuments as indices to the story of mind, we cannot pass unnoticed the series of frescoes in this basilica's porch, so full of meaning and importance, because fraught with the spirit of the past. Agincourt classes them among productions of the Greco-Italic school in Rome, probably from the period of Honorius IV., or but little later in the thirteenth century. We may begin with those on the lateral wall to our right before entering the church. A holy hermit was at prayer one night in his cell, when strange noises, like the tramp and shout of horsemen

passing by in tumultuous haste, aroused his attention, and led him to ask, leaning out of his narrow window, who thus disturbed his meditations at that hour?—"We are demons," was the answer. "The Emperor Henry has just expired, and we are bent on attaining our object by taking possession of his soul."—"I conjure thee," said the hermit, "to appear again to me on your return, and announce how you have fared in this serious business." The promise being given, that phantom-troop swept by; but the night had not waned before similar noises again disturbed the hermit, this time attended by violent knocking at the door.—"Now, tell me," asked the holy man, "how has it fared with the emperor?"—"Desperately ill," replied the demon, speaking from *his* point of view. "We came just in time. The emperor had that moment expired, and we began the asserting of our claims, when his good angel appeared, bent upon saving him. Our contention was long; but at last the angel laid the good and evil deeds of Henry together in a balance; after which for a time, our joy was great, seeing that on our side the scale sank visibly to the ground; but all at once came up that roasted fellow [thus did the evil one describe St. Lawrence], with a heavy golden pot in his hand, which he threw into the opposite scale, so that the other was made to kick the beam. We were thus forced to return in shame and confusion; and I could only vent my rage on the golden pot, one handle of which I broke off." After the discourse the demon troop departed, and the hermit could scarcely wait till morning to start for the nearest town, where the emperor had been residing in his last days, and had died. On arriving, he learned that Henry II. had expired, precisely at the hour of the first apparition before his cell, and that it had just been discovered how a gold chalice, presented by Henry to the church of St. Lawrence in that town, had unaccountably lost one of its handles.*

THE ARCHÆOLOGICAL INSTITUTE AT WARWICK.

If the most despairing Conservative, excited by what he might consider the progress of democratic institutions, would but refer to the papers to see the prices given at the recent sale of Mr. Daniel's for works of antiquarian value, he might be much relieved by the indication it gives of the increased desire to preserve the memorials of the past, and to cherish all that was good in old England. If he were not convinced by this, he should have attended our meeting at Warwick, where additional and unmistakable evidence was furnished by the ready assistance given by the inhabitants of the town and county to the object we had in view, and in the noble pride with which they have preserved, and in the honour they claim for, their monuments.

A more appropriate spot than Warwick for an illustration of the past could not have been chosen. In spite of railways and other transformers, it still retains the character of a town clinging round the castle of its feudal lord for support. A student could not find a calmer retreat: no bustle of business; no noisy children at play; and, whether this is owing to Mr. Bass's Bill cannot be said, not a single organ have I heard during the week. When I took a walk round the town the day before the meeting, not a footfall was to be heard, and the silence was something solemn and awful. A joke has been circulating among us, that a commercial traveller who arrived at the town for the first time inquired what the name of it was, and being told Warwick, he replied it would be a very pretty place if it had any inhabitants. It used, perhaps, to be a little more cheerful once, as there was a theatre; but upon the old principle, I suppose, of "the nearer the shrine," it has been converted into a police-station. However, the quiet of the town was amply compensated by the warmth and cordiality of our reception.

On Tuesday the inaugural meeting took place at the Assembly-rooms, where a flattering address of welcome was presented to us from the Corporation. The Marquis Camden resigned the office of president, and it was assumed with a warm-hearted speech by Lord Leigh. The usual routine of complimentary remarks was then gone through. The Bishop of Oxford made a "right merrie" speech, but impressing the necessity of studying the "velvety shadows of the past to enable us to live in the present and to anticipate the future." Mr. Bloxam then gave us a synoptical history of the county of Warwick, pointing out the most salient points of history, and directing our attention to the principal monuments that remain to illustrate it. A paper by Mr. Winston "On the Glass in the Beauchamp Chapel," was read by Mr. Petit. The author apologized for its being "necessarily dry and technical," as, judging by the emptying of the room, so the audience thought it. But there is a disadvantage in not reading a paper of this sort at the spot which it intends to elucidate. On the breaking up of the meeting we visited St. Mary's Church, which was briefly explained by the Rev. Herbert Hill, and we then entered the Beauchamp Chapel. Some complaint was made that no one was there to make any communication about it, but Mr. Gough Nichols justly replied, that "all information as to dates being given it would be better for every one to observe for himself;" a principle that may be often usefully laid down to prevent trivial discussion.

We then proceeded to visit the hospital founded by the Earl of Leicester in 1571, for the reception and support of twelve old soldiers or sailors and their wives. It is a most interesting specimen of a timber building of the period. Much of its ornamentation, in the shape of the escutcheons of the founder and his family, are modern. It is a gratifying thing to find that here the spirit of the founder is carried out more and the trust more sacredly fulfilled than with some charities. The income, which at the time of its foundation was about 200*l*., now amounts to about 3,000*l*., and the allowance to the brethren is now 80*l*. a year; and when sufficient accumulation has taken place the number of brethren is to be increased to twenty. It may tend to soften the indignation of those who only know Leicester from Sir Walter Scott's "Kenilworth" to learn that, though he feasted the queen, he "ne'er forgot the poor." There are preserved some pieces of embroidery, one a crest of a "bear and ragged staff," the other like a slipper before taken from its frame and made up, said to be worked by Amy Robsart when she was at Kenilworth. Whether this is on the authority of Scott, I don't know. We then went to view the remains of the ancient walls. At the evening meeting Mr. Bloxam, who was ever ready with his very valuable information, the result, evidently, of much study, read a paper on the "Sepulchral Monuments of Warwickshire of the thirteenth and fourteenth centuries;"* and the Rev. J. R. Green read a memoir on the siege of Kenilworth, a well considered paper, abounding in evidence, which he gave in the original Latin, and as on this occasion the majority of the audience was ladies, it is not for me to say whether they were interested or convinced.

On Wednesday there was a meeting of the historical section, when the Rev. C. H. Hartshorne read a paper on the "Parliament, or the Dictum of Kenilworth," travelling over a great portion of the ground occupied by Mr. Green on the previous evening, but with different conclusions. As doubtless both these papers will be published, it will be better to avoid discussion or comparison till then. A paper by Mr. Charles Twamley on the "Domesday Book for Warwickshire" was read, and we then adjourned to the Castle. How charmed and impressed every one was with the grandeur and beauty of this magnificent structure—how impressed with the beauty of the accessories! Cedars

> "High top bald with dry antiquity."

The castle showing, by its size, the splendour of the trees by which it is surrounded and embraced, and they, by their picturesque beauty, adding a charm to the building. The Rev. C. H. Hartshorne and Mr. Bloxam gave us all the historical evidence they were able to obtain in connexion with its erection. We then entered the castle, where our admiration was not diminished by viewing the treasures it contains. Mr. Scharf undertook to "discourse" on the pictures, and this he did in his usual fluent and agreeable way, unwearied and unwearying. Mr. Bloxam made some remarks in analysis of the "renowned Guy," tending much to explode that cherished legend. After viewing the lower apartments — dungeons of course—of the castle, we rushed, as archæologists can rush, to the carriages, and started for a visit to our president, Lord Leigh, at Stoneleigh Abbey. The present house is an Italian structure, built about a century since on the site of the abbey, of which there are very few remains. Mr. Bloxam produced a manuscript belonging to Lord Leigh, which was written by a monk, giving an account of the brethren, his contemporaries, and stated that it was as interesting and amusing as that of Joslyn, of Bury St. Edmund's: if so, let us hope it may be published. After being hospitably entertained by his lordship, we proceeded to Kenilworth. Mr. Hartshorne and Mr. Bloxam were again in request; but there was nothing to note more than has been written over and over again upon this ruin, which I cannot help thinking acquires more interest from Scott's romance, than from its picturesque beauty. The church, at which there is nothing but a Norman west door worth notice, and the church-plate at the house of the vicar, occupied our attention; "and so home."

On Thursday we went to Coventry, where we were received in St. Mary's Hall by the mayor and the corporation. The costumes of the mayor's sword-bearer, with the cap of maintenance, and the crier with modern habiliments, surmounted by a George III. wig, upon which was a Mediæval red velvet cap, very much like a cardinal's, excited some surprise, if not merriment; but the mirth of an archæologist does not, I hope, detract from his interest in the pursuit, or cause him to value less the efforts of those who entertain him. Here we also had an address of congratulation and welcome, accompanied by what must have produced more gratification to a true antiquary, a display of the muniments and manuscripts belonging to the corporation, a most interesting collection, containing documents from a very early date, royal autographs, guild books illustrating the customs and uses of trade, letters showing the political and social condition of the times when they were written, and also in connexion with the eccentric pageant for which this city has been so long celebrated. There is a bill of 1772, by which is shown that the corporation paid 2*l*. 2*s*. for a wig for my Lady Godiva. We then viewed St. Michael's Church, which is to be the cathedral when the inhabitants get their wish of a bishop being restored to them; Trinity Church, and the remains of the cathedral, which have been lately excavated. We also went to the White Friars, in the ambulatory of which we saw the present monks—the paupers belonging to the Union Workhouse. Ford's Hospital, St. John's Church, and Bond's Hospital, also occupied our attention. On our return to Warwick there was a *conversazione* in the Museum, which was an exceedingly good one, abounding in objects of interest contributed for the most part by those in the neighbourhood.

On Friday we started by special train to Lichfield, rather a long journey, but we were occupied, as Pepys would say, "with brave discourse by the way." On our arrival, we proceeded to the Guildhall, where Professor Willis gave us a lecture on the Cathedral. In saying it was Willis who spoke it is sufficient to imply that everything was clear, instructive, and convincing. He was followed by Mr. Winston, who read a paper on the glass in the Cathedral, which is of the Renaissance character, and dates from 1534 to 1539. He maintained that the style of this glass, its tone and mode of treatment, should be the standard of all modern glass painting. This paper, like that on the Beauchamp Chapel, had the disadvantage of being delivered where it was not illustrated; but afterwards, in the Cathedral, Mr. Winston was able to add a few words to illustrate more fully his meaning; and if he did not make converts, he certainly modified the opposition that the admirers of more ancient glass were inclined to exhibit. The approach to the Cathedral by the west front is, as all know, remarkably striking. The style on this side is very foreign; the central west door most beautiful. The interior is impressive, and the restoration has been carried out with judgment and effect. Professor Willis then pointed out the features and marks illustrative of the history of its construction, for which he had prepared us by his previous lecture. Mr. Scott also made a short address, explaining the principles upon which he had made the restorations, and confirming the statements of Professor Willis. We returned to Warwick, and at the evening meeting, Dr. Wollaston read a paper on "Mosaics;" and Dr. Collingwood Bruce, "On the Concentric Circles on Rocks in Northumberland."

On Saturday there was a meeting of the historical section, when a paper was read by the Rev.

* Narrated in the "Deutsche Sagen" of Grimm.

* This we give elsewhere.

G. Dodd, on "Boscobel, and the Escape of Charles II." He was followed by the Dean of Chichester, who gave us *the* paper of the meeting, "The Life and Times of John de Stratford, Archbishop of Canterbury and Chancellor to King Edward III." The rev. dean, in eloquent language, gave us a picture of the times in which Stratford lived, and proved him to be one of the greatest patriots in the long list of which England can boast.

At the conclusion of this paper, we took coach for Stratford-on-Avon, visiting *en route* the church of Charlecote, where are the monuments, and in most excellent preservation, of the Lucy family, and we afterwards proceeded to Charlecote, the seat of the Lucys, an Elizabethan mansion, not unlike Cobham in some of its features, but with many modern additions, in a beautiful park most magnificently timbered. As this house is not usually shown to visitors, our reception on this occasion was much appreciated by the members. The objects, however, that most attracted attention were modern; some Florentine mosaics, and above all the grand sideboard, executed by the unfortunate Wilcox, as fine a piece of modern wood carving as can be seen.

We then proceeded to the birthplace of the immortal bard, and here I must confess to some disappointment. There is no old world air about Stratford, and, except for "the house" and "the monument," there would not be the slightest attraction. How the inhabitants trade on these may be guessed from the notice on the church door, that you are requested not to encourage persons in the churchyard who loiter there on pretence of finding the sexton. Mine hostess of a tavern insisted on showing some of us "Shakspeare's smoke-room," and a cupboard from Newplace, in which the poet used to keep his pipe! Shops for the sale of relics, busts, photographs, show how much material benefit he is to his native place. I am afraid the traders on his fame are not confined to the shopkeepers. I profess a great reverence for the poet; but I must say that the tea-gardens sort of style about the whole of the exhibitions was very depressing and disappointing.

In the evening there was another *conversazione* in the museum.

On Monday morning the papers read were, "Notes on the Early Mints of Warwick," by E. Hawkins; "On the Black Book of Warwick," by G. T. Robinson; "On the recent discoveries at St. Alban's," by S. Sharpe; and "On the bust portraits, mask, and monument of Shakspeare," by E. T. Craig.

In the afternoon the members visited Maxstoke Castle, by invitation from Mr. C. Fetherston Dilke, calling by the way at Coleshill Church, which is a large and commanding building of two styles, Decorated and Late Perpendicular. It has a good tower and spire, of lofty dimensions. The chancel is of good proportion, but of a late character; and there are some good effigy monuments near the east end. The font is a very fine specimen of the Florid Norman style, and is in a good state of preservation. At Maxstoke a lunch had been prepared for us, which in munificence far exceeded anything in archæological experience. This having been "greeted" by upwards of a hundred, "not with vain thanks, but in acceptance bounteous,"—for it must be acknowledged that archæology is a wonderful appetizer,—we were conducted by Mr. J. Fetherston, who did the honours in the absence of his brother, through the building. It partakes more of the character of a castellated and embattled mansion than that of a castle, as it is quadrangular in form, with an entrance tower flanked by turrets on one side. On the opposite side of the court are the modern buildings used as a habitation. A portion of these are being rebuilt, to harmonize with the style of the works generally, which were built by Sir William de Clinton, *temp.* Edward III. It has passed into several hands, until it came into the family of Dilke. Nothing remains but the four walls and the gate-house, and there is no evidence of any keep.

Mr. John Fetherston was an excellent cicerone: he read an account of the castle, and his treatment of the subject was such as to make dry narrative and chronology both interesting and amusing.

We then visited the remains of Maxstoke Priory, of which there is enough to show that it must have been very extensive. The enclosing walls remain, as well as a very fine gate-house, of the same date as the castle. And so back to Warwick rejoicing.

There were two sources of great regret to us in the absence of Lord Talbot de Malahide and Mr. Albert Way, that of the former caused by domestic affliction, and the latter by ill health. The kind feeling which both have always shown to the members could not fail to increase the sympathy which the causes of their absence evoked.

On Tuesday the usual meeting for the transaction of business was held; and so terminated one of the most pleasant meetings the Institute has ever had. The impartial and honest chronicler will have to say that it will be remembered more for the excursions than for the papers read, but most of all for the cordiality with which we were received, "and so, farewell to Warwick."

F.S.A.

CURIOUS SEPULCHRAL MONUMENTS IN WARWICKSHIRE, OF THE THIRTEENTH AND FOURTEENTH CENTURIES.

This is the memoir read by Mr. Bloxam, as we have elsewhere mentioned:—The most ancient of the sepulchral monuments in this county is undoubtedly that huge and unlettered monolith at Long Compton, called the King Stone, standing near the circle called the Rollright Stones, which, together with a cromlech in its vicinity, stand in the neighbouring county of Oxford. This is the maenhir of the earliest type of sepulchral monuments of the ancient British period, and in accordance with that memorial noticed in Holy Writ as placed over the grave of Rachel. We have no Roman, no inscribed British-Roman, and no Anglo-Saxon monument at present visible in this county. The earliest monumental records we have in our churches are of the early part of the thirteenth century. Of this period is the sculptured and recumbent, though much mutilated, effigy of a knight, formerly in the Abbey Church, Merivale, and now preserved in the chapel of the gatehouse to that monastery. This is an effigy of much interest: it now consists, however, of little more than the torso or trunk, the head and lower portions of the legs having been destroyed. The armour consists of the hawberk or tunic of mail, with chauses or close-fitting pantaloons of the same: the hands are protected by mufflers, the fingers not being divided: the right arm and hand are lying on the breast: the left hand appears beneath the shield hanging down on the left side. Over the hawberk is worn the long sleeveless surcoat of linen, belted round the waist with a narrow strap and buckle. Another strap or guige, somewhat broader than the former, to which the shield is attached, crosses diagonally over the right shoulder to the left side. The shield on the left side is unusually long—not less than 3 ft. 9 in. in length—extending from the shoulder to the knee: it is not flat on the face, but curved, or convex without and concave within. In outline it is heater-shaped. The position of the sword is somewhat singular, being on the right side, and fastened to a belt crossing the body diagonally from the right hip to just below the left hip. This effigy bears a resemblance to two of, apparently, the most ancient of the sepulchral effigies in the Temple Church, London, which likewise exhibit the long shield, as in this, and much the same arrangement of the drapery of the surcoat.

I think this effigy is commemorative of the fourth William, Earl of Ferrers, born about the year 1193, and who died A.D. 1254, and was buried in the Abbey Church at Merevale. This effigy, considered by itself, I should take to have been executed some thirty years earlier than the time of his death, but there is no one else to whom I can assign it.

In the little village church of Avon Dassett, in this county, a few miles east of Kineton, is the recumbent effigy, perhaps unique of its kind, of a former incumbent of that church, who appears to have died before he had attained Priest's Orders, he being represented in the full vestments of a Deacon. In the twelfth and thirteenth centuries, and also in the early part of the fourteenth, it was by no means unusual for ecclesiastics of the inferior grades, such as deacons, sub-deacons, and even acolytes to become incumbents. We may find innumerable instances of this in almost any county history, in the lists of the incumbents of the several parishes, and their different grades in and towards the priesthood. This was felt to be an abuse, and in the second general council of Lyons, held A.D. 1274, the thirteenth constitution obliges the curates, or incumbents, to residence and to take priest's orders in the first year of their promotion. In the Council of Buda, held A.D. 1274, the 20th canon imports, that all those who have benefices with the cure of souls shall be ordained priests.

The slab out of which this effigy is sculptured is of dark-coloured forest marble, the effigy being represented lying beneath a horizontal canopy composed of a semicircular arch with the representations of buildings above, and this is supported by shafts with plain bell-shaped caps, running down the sides of the tomb.

The effigy, which is sculptured in relief, represents the person commemorated in the full vestments of a deacon. He wears the ancient cassock or ordinary habit, over which appears the alb, and over that the Dalmatic: on the right side underneath the Dalmatic and over the alb are the two extremities of the stole. The sleeves of the cassock and alb are close fitting: those of the Dalmatic are wide. About the neck appears the amice, and the crown of the head is tonsured. The right hand, held downwards, is grasping a scroll, one of the few instances in which sepulchral effigies are thus represented. The left hand is upheld on the breast and hanging down from the wrist appears the maniple.

But this effigy does not constitute the whole of this monument, for it lies under a sepulchral arch within the north wall of the chancel, of later date by a century than the effigy, being of the fourteenth century. This arch is ogee-shaped, but not crocketted: it is, however, cinque-foiled within, and is ornamented with the ball flower in a hollow moulding. It appears to me that in the fourteenth century, when the chancel was rebuilt, this sepulchral arch was constructed to contain the effigy of a former age.

I can find mention of one incumbent only of this parish of the thirteenth century.

"Hugo Rector eccles de Avene
Dereed mense Maie 1232."

I only know of one other sepulchral effigy of a deacon in this country. That is a mutilated recumbent effigy in relief lying amongst the ruins of Furness Abbey, Lancashire. This is somewhat rudely, at least formally, sculptured in relief from a block of lias or limestone, and from the hardness of the material the artist has altogether failed to give anything like effect or breadth to the drapery. The head has been broken off: the body of the effigy is represented vested in an alb with close-fitting sleeves: the alb is represented in parallel puckered folds. In front of the alb, near the skirt in front of the feet, appears the parura or apparel. The cuffs of the sleeves are also covered with parures or apparels; but these are quite plain. The alb is girt above the loins by the girdle, *cingulum, seu zona, seu baltheus*, the tasselled extremities of which hang down to the apparel at the skirt of the alb. This is the only instance I have met with in the sepulchral effigy of an ecclesiastic in which this vestment, the girdle, is apparent. From the wrist of the left arm hangs, in somewhat an oblique position, the maniple; and crossing diagonally from the left shoulder to the right hip, and thence falling straight down by the right side, with both extremities hanging down, is worn the stole. In front of the body a book is held with both hands. The slab out of which this effigy has been sculptured is coffin-shaped, wider at the upper part than at the lower, and I should infer is of the fourteenth century.

This effigy at Furness Abbey is illustrative of that at Avon Dassett, for the mode of wearing the stole over the left shoulder, with the extremities hanging down on the right side, was peculiar to the office of deacon, and is alluded to by Durandus, who, in treating of this office, tells us that the stole was placed upon the left shoulder, *supra sinistrum humerum stola imponitur*. The book represented is evidently that of the Gospels, for the same writer tells us that when the deacon was ordained there was delivered to him a stole, and the Book of the Gospels. *Diaconus cum ordinatum traditur sub certis verbis stola et codex Evangelii.* In a Manuscript Pontifical in my possession of the latter part of the fifteenth or early part of the sixteenth century, but which does not, probably, materially differ from the Pontificals of an earlier age, the bishop at the ordination of a deacon is represented as putting the stole over the left shoulder of the deacon and adjusting it under his right arm. *Hic Episcopus sedens cum mitrâ ponit stolam supra humerum sinistrum, reducens eam sub alam dextram,* &c. He, the bishop, is also represented as delivering

to the deacon the Book of the Gospels. *Hic tradit episcopus librum Evangeliorum.*

In these two effigies the Dalmatic is represented as worn on the one but not on the other; and this singularity may thus be accounted for: although the Dalmatic was worn over the alb by deacons, and the tunic was worn over the alb by sub-deacons, there were certain occasions on which neither the Dalmatic nor the tunic were thus worn. For, as Durandus writes, *non ergo diaconus dalmaticam nec subdiaconus tunicellam in diebus jejuniorum in officio missæ portant.* The maniple worn over the left arm was a vestment common to the various orders of the Church, from the sub-deacon upwards; for at the ordination of the sub-deacon, the bishop placed the maniple on his left arm, as appears by the Pontifical. *Hic episcopus sedens mittit manipulum in brachium sinistrum.*

The mode of wearing the stole by the deacon differed essentially from the mode in which it was worn by the priest, for in the case of the latter, the stole came over both shoulders and crossed the breast diagonally, or saltire-wise, in front, down to the girdle, from whence the two extremities, which were fringed, hung pendant, one on each side. This mode of wearing the stole is seldom visibly apparent on the effigies of priests, as the chasuble covers the alb, and the fringed ends of the stole only appear beneath the chasuble. In some few instances, however, as on a brass in Sudborough Church, Northamptonshire, the effigies of priests are represented without the chasuble, in the alb only, with the stole over, crossed in front, as if vested for the Sacrament of Baptism, or some other sacred office in which the chasuble was not required to be worn. This difference in the wearing of the stole between the priest and deacon is thus alluded to by Durandus:—*Orarium itaque jugum scilicet onus est jugum sacerdotibus, onus diaconibus. Unde fit est et sacerdotibus circa collum et diaconibus supra sinistrum humerum ponatur. Sicut enim jugum collo portatur sic et humeris onera feruntur.*

Of recumbent sepulchral effigies of priests I may briefly notice those at Hillmorton, Stoneleigh, and Kineton. These are represented in the vestments worn at the celebration of the Eucharistic Sacrifice in the amice, alb, stole, maniple, and chasuble. There is no peculiarity in any of these effigies: they are all of the usual type. In Newton Regis Church there is, however, a very curious monument of this era, consisting of a low tomb or slab rudely sculptured in low relief under a sepulchral arch in the north wall of the chancel. It represents in a trefoliated compartment the busto of a priest, with the missal or breviary on one side and a chalice on the other: above are angels waving thuribles, with the conventional representation of angels conveying a soul to Heaven in the likeness of a nude figure in a sheet. Two acolytes bearing tapers appear beneath the busto, whilst at the foot of the slab is sculptured the *Agnus Dei*, or symbolical representation of our blessed Lord under the type of a lamb, and at the head of the slab the *Spiritus Sanctus*, or Holy Ghost in the form of a dove. The execution of this monument is remarkably rude for the age in which it was executed.

In Polesworth Church, formerly conventual, is the very curious, and perhaps unique sculptured recumbent effigy of a prioress of that establishment,—a Benedictine nunnery. It is, I think, of the fourteenth century. Her head appears in a trefoil-shaped sinking. Round the head, chin, and neck is the coif and wimple, and over the head is worn the veil. She is habited in a large gown or cowl with wide hanging sleeves but without any mantle. In her right hand she held the pastoral staff, floriated within the crook, which is turned inwards, and in her left hand is held the *Horæ* or book of prayers, whilst beneath her feet is the figure of a hart or stag, perhaps in allusion to the verse in the psalms, "As the hart desireth the water brooks."

This is the only sculptured recumbent effigy of an abbess I have met with in this country. There are some few inlaid brass effigies, such as that at Elstow, in Bedfordshire, and some few statuettes, as those round the tomb of Lady Montacute, in Oxford Cathedral.

There is in the Church of Orton-on-the-Hill, Leicestershire, anciently a chapel belonging to the Abbey of Merivale, in this county, the recumbent effigy of a Cistercian monk, one of the abbots, I am inclined to think, of Merivale, and probably removed from the abbey church of Merivale to Orton on the suppression and destruction of the abbey church. It represents him in the *Cappa clausa*, or close cowl, with the mozetta and hood attached to it thrown back over the shoulders, whilst on the head is worn the coif or close-fitting scull-cap called the biretum. Over the head is an ogee canopy, which refers the date to the fourteenth century. This effigy is, as far as my knowledge extends, perfectly unique.

There is one more monument and effigy of the fourteenth century I consider greatly interesting. This is a rich high tomb, placed beneath a very rich canopied arch, at Cherrington Church, in the south of Warwickshire. The canopy or arch over that tomb takes in form that of a low and obtusely-pointed ogee arch, the interior mouldings of which are crocketted, whilst the under part or soffit is cinque-foiled. Hollow mouldings in the architrave contain a series of the ball and four-leaved flower, rich accessories in architectural details of the fourteenth century. The sides of the tomb are divided into a series of rich canopied recesses, ogee headed and crocketted, and trefoiled within the heads. On the north side of this tomb, which stands between the nave and eastern part of the north aisle, is a drain or piscina, into which the priest poured the water with which he washed his hands during the celebration of mass. This piscina, forming part of the monument itself, is a very curious arrangement, and I do not remember to have met with it elsewhere: it is, however, indicative of the fact that the east end of the north aisle had been converted into a chantry chapel.

The recumbent effigy on this tomb is very curious, and exhibits a singular specimen of the civil costume or ordinary dress of a gentleman, frankelein, or squire of a parish in the fourteenth century.

The dress is that which in ancient wills of this period is described as consisting of "*Tunica et Supertunica cum caputio*," that is, a long coat or tunic with close-fitting sleeves buttoned from the elbows to the wrists, the *manicæ botonatæ*: over this tunic is worn a supertunic or surcoat with loose sleeves hanging down. The supertunic is girt by a narrow belt buckled in front, and from this belt is suspended on the right side an anclace or knife. On the head, and covering the shoulders and breast, is a kind of tippet combined with a hood very like the modern cape, and called the caputium. The terms "cote and hood," two of the articles of apparel, are mentioned in Piers Plowman Crede, written in the fourteenth century, and also in the poems of Chaucer. On each side of the head of this effigy is an angel, and the feet rest against a lion.

Although this effigy is far from unique, there being many sculptured effigies of this class of the fourteenth century, which have not however been yet satisfactorily treated of or described, the whole of this monument is exceedingly rich and curious, and one of the most remarkable in the county of Warwick.

There are other monumental effigies of great interest and variety, of later date than the fourteenth century, to be met with in the county of Warwick, but these I do not now propose to dwell on, having limited my subject to a period not later than the fourteenth century.

FORMATIVE ETHICS, OR THE MORAL SCIENCE OF RECTIFYING ABERRATION, AND OF DEVELOPING THE PERFECT AND BEAUTIFUL.

After what has been just stated, therefore, it is not surprising to find that it is the character of all the higher laws of nature to assume exact numerical statement. All our knowledge of nature is derived through the subjective conditions of the five senses; and, as the fundamental form of sensation is quantity in power, space, and time, all science must be reducible to quantitative statement, and our knowledge of the ideally right, moral, beautiful, and perfect, should assume this form, or it can never lay claim to the title of "exact."

Aristotle's ethics are applications of the golden rule of the quantitative analysis of phenomena to morals, but only to ethics in their commonly accepted limited meaning, not as embracing in the wider sense herein attached to them the whole science of moral governance and formation; for, not only is human nature to be subjected to rectitude of thought, action and form educed to both spiritual and physical health and beauty, but the whole of terrestial nature committed to man's rule is to be compelled to its best issues, *i.e.*, its moral condition and form by the sovereign power of his right-mindedness. "The new man" restored in "righteousness and true holiness" is to be the re-creating spirit of the earth.

Ethics are to become the all comprehensive and exact records of those quantitative relations in which all things should consist, in their best or harmonious relations within themselves and to each other of that proportioned and measured at-one-ment or harmony of nature, of which every man's thoughts, and acts, are in a greater or less degree either constructive or destructive. This is the scope of Formative Ethics; it is also, let it be repeated, the scope of the sacred science which permeates the Scriptures. For, if we steadily and carefully contemplate the Christian mission, we shall find that its object is twofold. First, the spiritual regeneration of man,—the renewal of the mind or rectification of ideas; and, secondly, by means of the moral activity thereby produced, the rectification of organization and form.

This essay attempted, at its outset, to draw a closer attention to this secondary purpose of Christianity; and having emphatically pointed it out as the Formative Mission of man, now amplifies its expression according to the quantitative hypotheses to that of the Rectification of Nature according to Number and Measure. This amplification also is in accordance with Holy Writ.

Are not the references to measure in the sacred writings from the Mosaic records to the Revelations significant? Consider the lawgiver receiving the pattern "measure" or "number" whereby the typical tabernacle was to be constructed,—the vision of the prophets wherein they foresaw "a man with a measuring reed in his hand,"—the Christ who was exactly to define man's duty to his Creator and his neighbours, who was to reveal to whom understanding should be vouchsafed,—the ultimate harmony of the universe, the destined re-edification of the shattered temple of sensuous nature by the Holy Spirit of Truth.

The world has never profited by vagueness of expression: every great benefactor of the human race, like the master, has carried a rule in his hand, and has subdued his specific study to number and measure. Till exact, master minds grapple with a subject all is cloudy and empirical, the world is swayed hither and thither by guess-work and opinion. The master comes with the measuring compass of a precise intellect: he may be assailed, persecuted, but where darkness reigned there will be light.

The Pythagorean music of the spheres was but a glimmer of the fundamentally quantitative relations of phenomena, of that universal harmony, of that measured conformity of the material to the spiritual which is to come. "I am their music," saith Christ by the prophet, "the Christ who is the spiritual sun and centre of moral being, who hath given the measures to which nature is to be conformed, who hath measured the waters in the hollow of his hand, and meted out heaven with a span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance, and hath laid the foundations of the earth and the measures thereof, and hath stretched the line upon it, and hath declared that judgment shall stay to the line and righteousness to the plummet, that divers weights and divers measures are an abomination, but that a perfect and just measure is His delight; that He will not make a full end of the aberrant world, but will correct it in measure, in measure will he debate with it, and the measuring line shall go forth upon it, and it shall be holy in its re-edification by the Spirit of Truth, nor plucked up, nor thrown down any more for ever."

These connected passages from Scripture abundantly prove the quantitative nature of the restoration of the world to be effected by Christianity: the golden rod or reed in the hand of the effulgent humanity of prophetic prevision symbolises the obedience and conformity to a measured standard required of the Christian, those limits of temperance and moderation within which all the aberrations of nature will be ultimately restricted; and what do those words moderation and temperance imply but quantitative relation, a mid path or mid measure between the extremes of the too little and too much?

In the dismembered confusion of ideas, of which the sum of popular knowledge is generally composed, the sciences appear to be isolated and without bond or union, but a quantitative philosophy brings all ideas and things together in one comprehensive grasp, and shows that

* See p. 561, *ante*.

all their differences are radically reducible to quantitative expression.

Every species of phenomena has its gamut of variation, between the limits of which lies its normal or mean condition, to which were we without other testimony the law of probability would give the preference. Man can only understand the limited. The powers of organic and inorganic being are fixed within limits, the bounds of which it is destruction to pass. There is a point beyond which there is no strength gained by adding thickness to iron, or wisdom by cramming the memory with facts. Stellar, climatic, political, ethical, and æsthetical phenomena oscillate within narrower or wider bounds, between which lies that tenor of moderation most desirable; and it is found that these aberrations, oscillations, or fluctuations of phenomena are inversely less and insignificant as we pass from the immediate sphere of human influence to the distant planetary spaces, where the periodical fluctuations of phenomena oscillate to and fro about a *mean value*, from which they never depart to any ruinous extent, but only within very moderate and reasonable limits,—but of this more anon.

We shall now rigorously enter upon the quantitative analysis of phenomena, of sensation, which presents three fundamental kinds of quantity. Force, Space, and Time at the basis of our ideas of any sensation, neither of which can possibly be conceived absent from it: abstract every phenomenon from sensation but these ideas and a sensation is still conceptible: withdraw either of them and it is not. At the basis of every visual sensation will be found the ideas of force, space, and time. 1. Force—in the strength or weakness of the light. 2. Space—in the superficies and shapes of impressions. 3. Time—in the duration of the impressions. At the basis of every sensation of hearing: 1. Force—in the strength or feebleness of sounds. 2. Space—in the volume of sounds and notes. 3. Time—in the duration of sounds and notes. At the basis of every olfactory sensation: 1. Force—in strong or weak odours. 2. Space—in the extent of the sensorium impressed. 3. Time—in the duration of the sensation. At the basis of every sensation of taste: 1. Force—in strong or weak flavours. 2. Space—in the extent of the sensorium impressed. 3. Time—in the duration of the impression. At the basis of every sensation of touch: 1. Force—in the strength or feebleness of the impression. 2. Space—in the extent of the body impressed. 3. Time—in the duration of the impression. Without this categorical elaboration, perhaps, the fact of force, space, and time, being the fundamental form of sensation might be made more apparent by putting the following question:—Can any one conceive of a sensation independently of the ideas of the sensorium being moved (force), in a definite space during a certain time? These three fundamental ideas of sensation, of phenomena, are on the physical hypothesis of causation the three fundamental conditions of nomena, or on the dual hypothesis, of spirit and substance. Now, these three fundamental ideas of phenomena are quantifiable.

Quantification,* therefore, is a possibility to which all our ideas, and it is also supposed the nature external to us, may be subjected. The theory of the rectification of nature then, to be scientifically exact, resolves itself into the determination of rectitude in the forces, the spaces or forms, and the duration or times of phenomena, and the means of producing it. Here, then, is the fitting place to introduce the postulates of the science of quantitative ethics.

Postulates of Quantitative Ethics.

1. All phenomena are quantifiable. The idea of quantity lies at the basis of all our mental conceptions. It is on this account that the mathematics are of all the sciences the most rigorous and certain in their reasonings and conclusions, for all their premises and deductions exist in or are made from the nature and constitution of the mind itself.

2. Numbers are the symbols of quantities: every quantity may be numerically expressed.

3. The conditions of phenomena can only be definitely expressed by reference to number and measure.

4. All phenomena are either as they ought or ought not to be, and therefore exist in either right or wrong quantity or quantities. Perfection and imperfection, therefore, may be numerically expressed.

5. The Rectification of Nature can only be confidently proceeded with on the knowledge of the right quantitative condition or proportional relations of every species of phenomena. The Quantitative Rectification of Nature, therefore, definitely expresses man's Formative Mission.

6. As the three necessary quantitative concomitants of all phenomena are force, space, and duration; in which three kinds of quantity, from the planets to the minutest function of human, animal, and vegetable life, all things fluctuate. Quantitative Ethics have to determine which of all the possible fluctuations of every species of phenomena in these three kinds of quantity is the condition of rectitude.

7. As every variable species of phenomena fluctuates or aberrates within certain limits, the sum of the quantities of all its possible instances divided by the number of those possible instances gives a mean or average which is the numerical expression of the idea of phenomenal rectitude. For of all the possible instances, it might be argued, *a priori*, one-half of them would, in all probability, err in excess; the other in defect, either on the side of the *too little* or *too much*. This *mean* then is the quantitative expression of the ideally right—the moral, and of the sensuously good, beautiful, and perfect.

8. As all ideas and things must exist in definite quantities, he who denies the mean to be the quantitative expression of absolute rectitude, and of the measure of sensuous beauty and perfection, has to prove that they inhere in some other quantity, which must be of either excess or defect, which is absurd.

9. To realize this mean or average condition in every instance of every species of phenomena, would be to establish equality amongst all the instances of a species. Now, equality and greatest difference are the extremes or limits of ratio, between which all other ratios lie; and experience teaches us that either of these extremes of equality or of greatest possible difference existing between all the instances of any species of phenomena would be repugnant to human ideas as at present constituted. Although, therefore, the mean is the perfect mid-point of absolute rectitude; yet to realize this state in all the instances of every species of phenomena would be to produce an equality in nature which would be as objectionable to human ideas as the greatest possible difference between all the instances of every species of phenomena. If, therefore, variation or aberration be necessary,* to what extent may it be permitted from the perfect mean or mid-point of perfection? Applying a similar law to variation, the reply is that mean variation may be permitted, that is to say, variation within the *via media* of moderation.

10. The great compensating remedial or curative law for excess and defect in nature is the following:—That every aberration of any system in excess of its *mean state* must be compensated for at some time or other, by an equal and opposite one in defect, or the balance of that system will be impaired, or its very existence threatened. This holds good equally in human, animal, and vegetable organisms, as in the larger phenomena of the planetary system.

11. The variation or fluctuation of ratios between equality and greatest difference, between 1 : 1 and 1 : 0, forms a calculus whereby the mean of rectitude and the harmonic relations of quantity may be demonstrated.

12. The summary of the science of quantitative ethics, then, is that the Mean sometimes called the Golden and Immutable† is the quantitative expression for the moral ideal‡ and moral form of phenomena of the ideally and sensuously good, beautiful, and perfect, of those types which are the *beau ideals* of the arts; and that the great Remedial, Curative, or Restorative law of nature, the Law of Compensation, points out the method by which this *mean state* or *moral form* is to be re-established throughout the solar system.

The development of the hypothesis from its general conception to the precise and definite idea given by the introduction of the *exact* or scientific element may be traced in the various titles it has assumed in the progress of this essay:—

"Formative Ethics," "The Rectification of Nature by Mind," "The Rectification of Nature by Right Ideas and Action," "The Rectification of Nature by Moral Ideas and Action,"—which became on the introduction of the exact scientific element; "Quantitative Ethics," "The Quantitative Rectification of Nature by Mind," "The Quantitative Rectification of Nature by Right Ideas and Action," "The Quantitative Rectification of Nature by Moral Ideas and Action."—the end being to supply a criterion of judgment, to beget exactitude of mind, to develop the sensuously good, beautiful, and perfect in nature and art, and to restrict the fluctuations of all phenomena within the bounds of moderation.

We have now to seek confirmation of the leading principles of the quantitative hypothesis by interrogating nature. Let us inquire, then, if there be any facts in astronomical science, in the simplest and grandest phenomena of nature, in the laws of the planetary forces, spaces, and times, which point to the mean as the right quantitative expression of rectitude; for if there be, there is proof positive of its truth, and that it is of divine institution,—a law, an idea beyond human invention or caprice. The following quotations from the highest authorities place it beyond the sphere of doubt and debate:

Experience interrogated in reference to the Mean, being the quantitative expression of Rectitude, and the Measure of the Moral Form of Nature.

It lies in the path of development which science pursues, that that which long stood isolated becomes connected by degrees, and subjected to higher laws. The scientific man advances full of expectation that "Nature," as Plato tells us Socrates once observed, "shall have interpretations according to reason;" and as he traces the connexion of all phenomena, and observes their subjection to the same simple laws, becomes deeply impressed with a belief that both the spiritual and material forces subject to periodic perturbations, move in fixed and eternal cycles. Such a conception of the two spheres of being, the spiritual and material, leads to clearness and simplicity of view, and the discovery of laws which are the ultimate term of human inquiry.

The crude heap of physical dogmas which one age heaps on another is not merely injurious, because it cherishes individual errors, because it obstinately presents indifferently-observed facts for acceptance: it does more than this, it opposes everything like grand or comprehensive views of the fabric of the universe. Instead of investigating the *mean* or mid-point about which, despite the unfettered aspect of nature, all phenomena oscillate within fixed limits, it only takes cognizance of aberration. In all that is mobile, changeable in space, *Mean Numerical Values* are the ultimate object: they are, indeed, the quantitative expression of laws, and show us the immutable amidst the perturbations and fluctuations of phenomena. The quantitative or exact method pursued by modern science is pre-eminently distinguished by the attainment and correction of *Mean Values*.

This useful and valuable property of *The Average* of a great many observations, that it brings us nearer the truth than any single observation can be relied on as doing, renders it the most constant resource in all inquiries where accuracy is desired. And it is surprising what a rapid effect in equalising fluctuations and destroying deviations, a moderate multiplication of observations has. Geometers have demonstrated that in the midst of all the fluctuation which can possibly take place in the elements of the orbits of the planets by reason of their mutual attraction, the general balance of the parts of the system will always be preserved, and *every departure from a Mean State periodically compensated.*

It has been demonstrated, that all the changes which the mutual actions of the planets on each other can produce in the course of indefinite ages, are periodical, that is to say, increasing to a certain extent, and that never a very great one, and then again decreasing; so that the system can never be destroyed or subverted by the mutual action of its parts, but keeps constantly oscillating as it were round a certain *Mean State* from which it can never deviate to any ruinous extent. The researches of Laplace and Lagrange in particular have demonstrated *the absolute immutability of the Mean Distance* of

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* This may help to explain an expression attributed to Pythagoras, viz., "that things are the copies of numbers," which meant, perhaps, that all things might be quantitatively expressed, and symbolised by numbers.

* Observation of the larger phenomena of nature favours the belief that thus even small aberrations are diminishing.

† One of the books of Confucius is said to be entitled "The Immutable Mean."

‡ The moral ideal here referred to is, of course, that of human nature.

each planet from the sun and consequently of its periodic time. Observation shows *the Mean Eccentricity* of the moon's orbit to be the same now as in the earliest ages of Astronomy.

The time occupied by one complete rotation of the earth on its axis, or the *Mean Sidereal Day*, may be shewn on dynamical principles to be subject to no variation from any external cause; and although its duration would be shortened by the contraction in the dimensions of the globe itself, such as might arise from the gradual escape of its internal heat, and consequent refrigeration and shrinking of the whole mass, yet theory, on the one hand, has rendered it almost certain that this cause cannot have effected any perceptible amount of change during the history of the human race; and on the other, the comparison of ancient and modern observation affords every corroboration to this conclusion. From such comparisons Laplace has concluded that the sidereal day has not changed by so much as one hundredth of a second since the time of Hipparchus. The *Mean* sidereal day therefore possesses in perfection the essential quality of a standard unit, that of *complete invariability*. The same is true of the Mean Sidereal Year, if estimated upon an average sufficiently large to compensate the minute fluctuations arising from the periodical variations of the major axis of the earth's orbit due to planetary perturbations.

[The lecture is here amplified with numerous instances of the law of compensation by which the slight perturbations, fluctuations, aberrations, and eccentricities of planetary phenomena are periodically rectified, the balance of the various parts of the System Restored, and its Immutable Mean State preserved.]

The legacy of research, which Newton may be said to have left to his successors, was truly immense; yet Newton himself never entertained a conception of a demonstration of the stability and permanence of *the mean state* of the system, under all the accumulating influence of its internal perturbations: this labour and this triumph were reserved for the succeeding age, and have been shared in succession by Clairant, D'Alembert, Euler, La Grange, and Laplace.

In particular, the researches of Laplace, Lagrange, and Poisson have shown the ultimate invariability of the *Mean Distance* of each planet from the sun, and consequently of its periodic time.

Relying on these grand discoveries we are enabled to look forward from the point of time we now occupy many thousands of years into futurity, and predict the state of our system without fear of material error but such as may arise from causes whose existence at present we have no reason to suppose, or from interference we have no reason to anticipate.

In the foregoing conclusions of consummate geometricians in respect to the law of compensation and of the permanence of the *Mean State* of the solar system, the leading principles of Formative Ethics have been, as we anticipated, fully corroborated. The great Law of Compensation enunciated in postulate 10, and that of the *Mean* as the quantitative expression of phenomenal rectitude, postulate 8, have received ample confirmation.

We have learned that all the aberrations of the solar system in excess of its *Mean Conditions*, though they be but slight, must be compensated for at some time or other by equal and opposite ones in defect. This *Immutable Mean*, then, is the quantitative expression of the Moral Form, or in other words, of the perfect or ideal state of the solar system. These astronomical evidences of the truth of the theory of Formative Ethics have the greater weight, inasmuch as they were unknown to the writer when he framed it: he felt, however, that if his theory were correct, it would be confirmed by an examination of the scientific records of the larger phenomena of nature.

The universality of the leading principles of Formative Ethics has now to be traced by descending from the planetary spaces, to atmospheric, terrestrial, and human phenomena till the first purpose of this investigation be accomplished, and the fundamental principles of the fine arts of æsthetic proportion be left demonstrated and established in the last sections of Formative Ethics. W. Cave Thomas.

Newspaper Press Fund.—The general meeting was held on the 30th ult., Lord Houghton presiding, when a very satisfactory report was presented. The accounts showed a balance in hand of 1,346*l*.

NOTES OF A PROFESSIONAL TOUR IN THE COLONIES.

In the year 1858 I left Southampton for an extended residence in Central America and the West Indies, and I proceeded on my voyage in the ship *Atrato*, an iron vessel belonging to the extensive fleet of the Royal Mail Steam Packet Company, commanded by Capt. Woolley.

We had about 150 passengers on board, of almost all races: a motley collection of English, American, Spanish, French, Italian, Mexicans, coloured Creoles of the West Indies, *et hoc genus omne*. We passed the Azores on the sixth day, but it was too hazy to see them, and the weather was then getting very warm.

In this course across the mid-Atlantic the eye is seldom relieved by the sight of a "sail;" nothing but the heaving and swelling of the dark blue waves, and the fleeting and changeable character of the overhanging clouds; in fact, for a day or two after you leave Southampton until a day or two before you arrive at St. Thomas's, seldom are any vessels to be seen; and when seen on the horizon they look like mere spots or specs on the sun's disc.

On the tenth evening after embarkation I saw one of those gorgeous and brilliant sights, the setting sun at sea. The clouds just above the horizon presented such a splendid effect of various colours, warm and glowing tints, crimson and gold, and hues of all creation, that no language can adequately describe, and which would puzzle even the magic pencil of a Claude to accurately portray. As the poet says:—

> "Who can paint like nature?
> Can imagination boast amid the gay creation hues like these;
> Can it mix them with such matchless skill
> And blend them one in the other
> As it appears in every bud that blows?"

I had also a very splendid view of the comet, the tail showing itself very distinctly, from the clearness of the atmosphere, and the canopy of heaven was studded thickly over with innumerable stars of remarkable brilliancy. The rising of the moon is also an interesting phenomenon at sea: gradually and slowly emerging from the horizon she sheds her pale reflected light on the ever-varying waters of the deep, throwing them alternately into light and shade; and many amuse themselves by leaning over the bows of the vessel, as she ploughs her undeviating trackless course through the watery element, to see innumerable rays of phosphoric light thrown out by the medusa (or jelly) and other fish at the approach of danger and to light them to escape being run down: these vie with the heavens in vivid brilliancy. The seas in the tropics swarm with piscatorial life.

On the 13th we were all alarmed and thunderstruck by the sound of the fire-bell. This was to call up all hands to go through the fire-extinguishing exercise. It was all so quietly arranged that but few knew it, except the officers and crew; and judge the consternation it created: but the alarm was soon appeased when information of the cause was given.

On the 14th day we passed the group of Virgin Islands to the north of our course; we then slowed speed, and anchored for the night off St. Thomas's. At six a.m. steam was up, and we entered the harbour of St. Thomas, an island belonging to the Danish crown. It is situate on the south side of the island, and has rather a narrow channel for the entrance. It is perfectly land-locked, east, west, and north, and the entrance is fortified on each side with small batteries. There is a fortification, also, in the town, opposite the entrance, and a lighthouse on the point. The principal town, Charlotte Amalie, is situate on the side of the mountain facing you as you enter the harbour. It is built in the shape of three flat cones, their bases joining and commencing at the edges of the water in the harbour; and, tapering gradually up to their apexes, the houses appear from the harbour to be built one above another.

The principal buildings are the governor's house, in the Grecian style of architecture; the fort, Blue Beard's Castle (an ancient structure); the hospital, &c.; and many good private houses.

The absence of chimneys to the houses appears striking, and they have the advantage of a beautiful clear atmosphere, not dimmed with smoke, as with us at home. The windows and jalousies occupy nearly the whole fronts. The roofs are many of them covered with galvanized iron, or gaily painted shingle: these with the verandahs and balconies painted in bright colours, and the cream-coloured tint of the stones with a bright sun shining upon them, produce a dazzling and brilliant effect. The streets are rather narrow and not very well cleansed. There are some good stores and hotels in the place, also places of worship and residences.

The geological stratum of the island is a whitish limestone, of which the principal houses are built. The land at the back of the town rises to a considerable height, and is covered with stunted trees and bush.

The island, which is seventeen miles long and five broad, population about 13,000, is not very productive, yielding only a little sugar, rum, cotton, and coffee. In consequence of nearly all the timber being cut down, it is very much subject to drought; this occasions a scarcity of water, which interferes very seriously with the successful cultivation of the island; and the inhabitants have to depend principally on the trade produced by its being the central station for the royal mail steamers. The company have extensive works erected there—a patent slip, &c., for repairing their vessels. The inhabitants supplied us with fine alligator pears, pines, oranges, bananas, cocoanuts, &c., and also cigar-cases and cigars, fans, bracelets, and other fancy articles for ladies.

Before the last mail contract was entered into between the Government and the company, it was suggested to remove the station to Antigua, it being an English colony, an island with harbours every way adapted for an extensive trade; but the gaieties and allurements of St. Thomas's, "this gem of the tropics," it is said, prevailed over every other consideration, so that the intention was abandoned.

About two years ago I suggested in your pages the desirability of connecting this island with the West Indian Islands and the main land at Demerara by means of the submarine telegraph, so that the important colonies south of it could have better communication with England and each other. This, I am glad to see, is likely to be carried out, a company having been established for the purpose, which will have a very beneficial effect on trade and commerce. The harbour of St. Thomas is very unhealthy: the crews of the mail steamers suffer fearfully from yellow and other fevers; some vessels lose from thirty to thirty-six men when lying there only fourteen days waiting for the return mail. This heavy mortality might be considerably reduced or mitigated by strict sanitary arrangements, and by perfect temperance on the part of the crews. The *Atrato* is a splendid sea-boat for a smooth sea, but rather too narrow for heavy seas, or wind on the beam, when she rolls most unpleasantly. Our speed was very good; we made 11 knots at starting, and increased it to 14 knots and 14½ knots before we arrived at St. Thomas's—a very expeditious and satisfactory mode of transit. We arrived on the 1st of October, and on the morning of the 2nd we transhipped our luggage, &c., on board the *Derwent*, one of the old school of steamers that are employed in the intercolonial trade; and on leaving the harbour the signal-gun was fired, which echoed and reverberated from mountain to mountain, and, with three hearty cheers from our fellow voyagers on board the *Atrato*, bidding us God speed, and a merry tune from the bands, we steamed out of the harbour.

St. Thomas was soon lost to the view, and we passed Cat Island and the Island of Vieque, and made Porto Rico, a Spanish island. It appears to be mountainous in the interior, and to be well cultivated. Plantations and sugar-works are numerous, and the cocoa-nut trees fringe the margin of the island. The western part appears flat, and the best cultivated.

Our course lay to the north of Porto Rico, and we entered the harbour of St. Juan about sixteen hours after leaving St. Thomas's. It is a beautiful and capacious harbour, land-locked, and is well fortified at the entrance every way, mounting a large number of guns. At the entrance to the harbour there are two islands, the one being strongly fortified with a circular tower or castle upon it, to command the entrance and the whole of the harbour.

The town appears to be walled in and fortified at intervals; the houses are principally built of a whitish, slightly tinged with yellow, limestone, probably a similar stone to that of St. Thomas, and the sun shining full upon it gave it a bright and dazzling effect.

The houses are principally of the old Spanish type, having generally verandahs, balconies, jalousies, and other conveniences conducive to comfort in tropical climes. There are capacious barracks and hospital, and a large well-built

square residence occupied by the governor. We stopped there about one hour, delivering and receiving the mails, and then steamed on our way.

The island of Porto Rico, which is about 96 miles long and 36 miles broad, is very luxuriant and productive,—chiefly sugar, rum, &c., and it also breeds fine cattle, which command an extensive trade in the West India Islands. It must be a very valuable acquisition to the Spanish Crown.

The following day passed Mona Island, between Porto Rico and St. Domingo, which is very celebrated for turtle, and at nine a.m. saw the coast of St. Domingo in the distance. The following morning found us coasting along the island of St. Domingo, then presided over by the Emperor Solouque, a negro dignitary: he passed a decree to confiscate all the whiteman's property, and to stop their trading there, so as—to use a nigger phrase—that "the darkies may reign;" but their triumph was short-lived.

We entered the harbour of Jacmel, which is not very large, and is much exposed. The town is hid by a projecting point of land, so that not many houses are seen, and those that are seen are built of wood. The hills at the back of the town are covered with trees and brushwood, and some very fine cocoa-nut trees line the beach near the town.

I saw a kite flying on shore (reminding me of home), the handiwork of some little aspiring negro studying civilization.

We landed eight passengers and the mails, but the swell of the sea is so very heavy in the harbour, that the steamer could not lie to or anchor, and she had to be kept steaming in a rotary motion, to prevent her being washed ashore, the ground swell being so very heavy.

Left Jacmel and steamed slowly along, gradually losing sight of St. Domingo, which soon appeared like a cloud on the horizon, growing gradually fainter and fainter until lost to sight. A rainbow showed itself shortly after, which the sailors said indicated a squall: this came on very suddenly, and it rained heavily, the clouds showing themselves first, followed by sudden gusts of wind and rain, as peculiar to the tropics.

On the following morning we made the shores of Jamaica, "the Queen of the Antilles" looming in the distance; discerned the Morant Point Lighthouse on the east end erected by Mr. Gordon, coasted along the island of Jamaica, and a few hours brought us to Port Royal, where there is another lighthouse, and we were soon brought to anchor in the harbour of Kingston.

There are several small islands at the entrance, and the land at Port Royal, on which there is a military station, is low and flat: the deep water channel is narrow and circuitous, and we were obliged to take soundings to ascertain our course.

There were a frigate and three gun-boats lying at Port Royal, and the military authorities saluted us with two guns. On our arrival at Kingston harbour, we steamed up to the wharf with a merry tune from the band: we were received by a large concourse of people to welcome us, and learn tidings from home. A few passengers left us here, amongst them one colonel of the army, and two members of the Jamaica Assembly. The city of Kingston is a curiously built place; the houses are principally erected of wood, though there are many good brick and stone stores, and other buildings. The main streets run north and south, and at right angles to the harbour: other streets cross these at right angles, so that the town is uniformly laid out, but many of the streets are narrow.

There are numbers of trees amongst the houses, viz., cocoa-nut, cabbage, citron, star apple, papaw (whose fruit and leaves render the toughest meat tender), the mango, bread fruit, castor oil, banana, &c., which have a very curious effect, and are, doubtless, planted for shade as well as profit.

The principal streets are Harbour and King streets, and the Parade (a square) and several minor streets. The church is in the parade. The barracks, the theatre, a large Wesleyan Chapel, the Market-place (which is a square place surrounded with a wooden fence), Assembly Room (a perfect barn-looking place filled with old carriages, &c.); and near the Parade is the Roman Catholic Chapel, a large building with high-pitched gable-ended roof, circular-headed door and windows (the latter full of stained glass); and the Presbyterian Chapel, Gothic edifice of brick and stones,—the only building I saw with any pretensions to architectural merit. There are also Baptist, Independent, and Jewish places of worship.

The commander-in-chief's residence is situate in the northern suburb: a spacious house in the tropical style, with balconies and verandahs round filled in with jalousies, and the grounds are covered with beautiful shrubs and flowers,—the tamarind, orange, lemon, and lime trees, bamboo cane, Jerusalem thorn, oleander, African, Chinese, and other roses, jessamine, granadillos, scarlet cordias, mignionette-trees, Barbadoes pride, blue wreath, &c., in all their magnificent varieties of colours and tints.

The hotels in the place are very poor and miserable. The houses remind one very much of Chester: they are mostly built on wooden pillars, or the balconies and verandahs are supported on pillars in the front, and you walk under them as you would through the rows, except there are not always stores underneath. Some of the houses have square-headed windows, with outside Venetian blinds, and the spaces between the windows are filled in with jalousies, so that air may be freely admitted to the apartments,—in fact, the fronts look as if they were all windows.

To some of the houses there are corridors or balconies all around them. The principal entrance is sometimes the front and sometimes the back. If in the front, you enter the hall—the principal reception-room—through the gallery or balcony; if in the back, you pass through a passage between the bedrooms to approach the hall. The hall generally occupies the front of the floor, and the bedrooms are situate on each side the passage at the back part: this is the plan for one floor, and the others generally correspond. There is also here, as at St. Thomas's, a total absence of chimneys, except to the kitchens, which are detached from the residences.

The streets are generally in a very bad state; they are called macadamised, but they appear to me to be covered with loose sand or shingle, which in the wet season must be knee-deep in mud, and very dusty in dry and windy weather; the channels are in bad repair and badly laid out, and there is no under drainage; the scavengering is also very much neglected, except what Nature has provided in the black vulture, called "John Crows." Goats, pigs, dogs, &c. roam at large about the streets, which is a nuisance to the inhabitants, adding very much to the filth of the place. The authorities seem to think there is no remedy for the bad state of the streets in consequence of the heavy and destructive wash of the tropical rains; but if they were to visit some of the Danish islands, and even the English ones, Antigua for instance, they would see it was possible to have good and smooth street surfaces, also well-paved channels and an efficient mode of scavenging, even without the help of that useful and voracious bird the "John Crow."

The town is well supplied with water, works having been established to supply it from the streams collected at the base of the Blue Mountains. The principal station of the troops is at Newcastle, located in the mountains, 5,000 feet above the sea (the summit of the Blue Mountains is 6,739 feet above the level of the sea); they have there quite a European climate, and produce European vegetables and fruits of all sorts. This station is of immense advantage to the health of the troops.

The harbour of Kingston is capacious and land-locked, supposed to have been formed by an earthquake that swallowed up the site upon which old Port Royal stood, and it is said that the tops of the houses are to be seen now in the bed of the harbour on a calm day. It is sheltered by a natural breakwater or palisade, on the extremity of which Port Royal is situate, about six miles from Kingston; it is strongly fortified, that and other fortifications in the harbour mount about 150 guns.

The town, in the heat of the day, presents a very quiet and deserted appearance; the negro men and women lounge about all day in the streets, seeking the cool shade of the houses, some selling fruit, others cakes and sweetmeats; they appear to lead a very unprofitable and indolent life.

The public works do not appear to have been very well conducted. Great disputes have existed for some time past respecting the main roads, bridges, &c.; the expenditure on which, according to the last Blue Book, was 15,800*l*. They had also reconstructed the asylum, repaired the general and female penitentiaries, public hospital, and building in Spanish Town and Montego Bay, and bridges over the Rio Pedro and Rio Minho. The amount required to complete them was 7,050*l*.; and there has been already expended on them 16,175*l*.

Recently the colonial engineer has been discharged, in consequence of its being discovered he was improperly interested in a contract for a public tramway they were constructing, which has been alluded to recently in the House of Lords.

The island of Jamaica is about 150 miles long, and varies in width from 17 miles to 45 miles; its area is 4,292 square miles, and its population in 1851 was 465,000; in 1862, 441,225; showing a decrease of 23,775 in a period of about ten years. Many of the estates are thrown out of cultivation for the want of labour, and this evil is aggravated by the absentee proprietors, who leave their estates to the management of attorneys, managers, &c., to extract every penny from them and grind down the price of labour, at which the labouring population very naturally rebel. An able-bodied labourer would get from 10d. to 1s. per day. These remarks apply to most of our West India colonies, and I feel well convinced that a more liberal treatment on the part of the proprietors, &c., of estates, the scarcity of labour would not be so severely felt. The climate around Kingston is very warm: the maximum temperature is 89 degrees; minimum, 71 degrees. Hurricanes sometimes occur here, and the annual rainfall varies from 59 inches to 127 inches in a period of nine years. The geology of the island is slaty schist; above it, blue limestone; next, grauwacke, surmounted by red sandstone and clay. Recent investigators assert that the base is porphyry, sienite, and greenstone, supporting the deposition and transition rocks. White and blue limestone, bastard marble, quartz in some places, ribbon rock, formed of alternate porphyry, trap, hornstone, and petro silex, which varies in the different districts. Gold and silver, copper, lead, and iron, have been found in the Blue Mountain range and other places, which have opened a fine field for capital and enterprise, and which are as yet but little developed.

On the day following our arrival we were transhipped to the *Eagle*, a small steamer intended to carry us to our destination—Central America. My fellow-passengers were three ladies and one gentleman (five in all); these only, with the mails, were to traverse 700 miles of the Caribean Sea to British Honduras, which cannot form a very profitable speculation to the company.

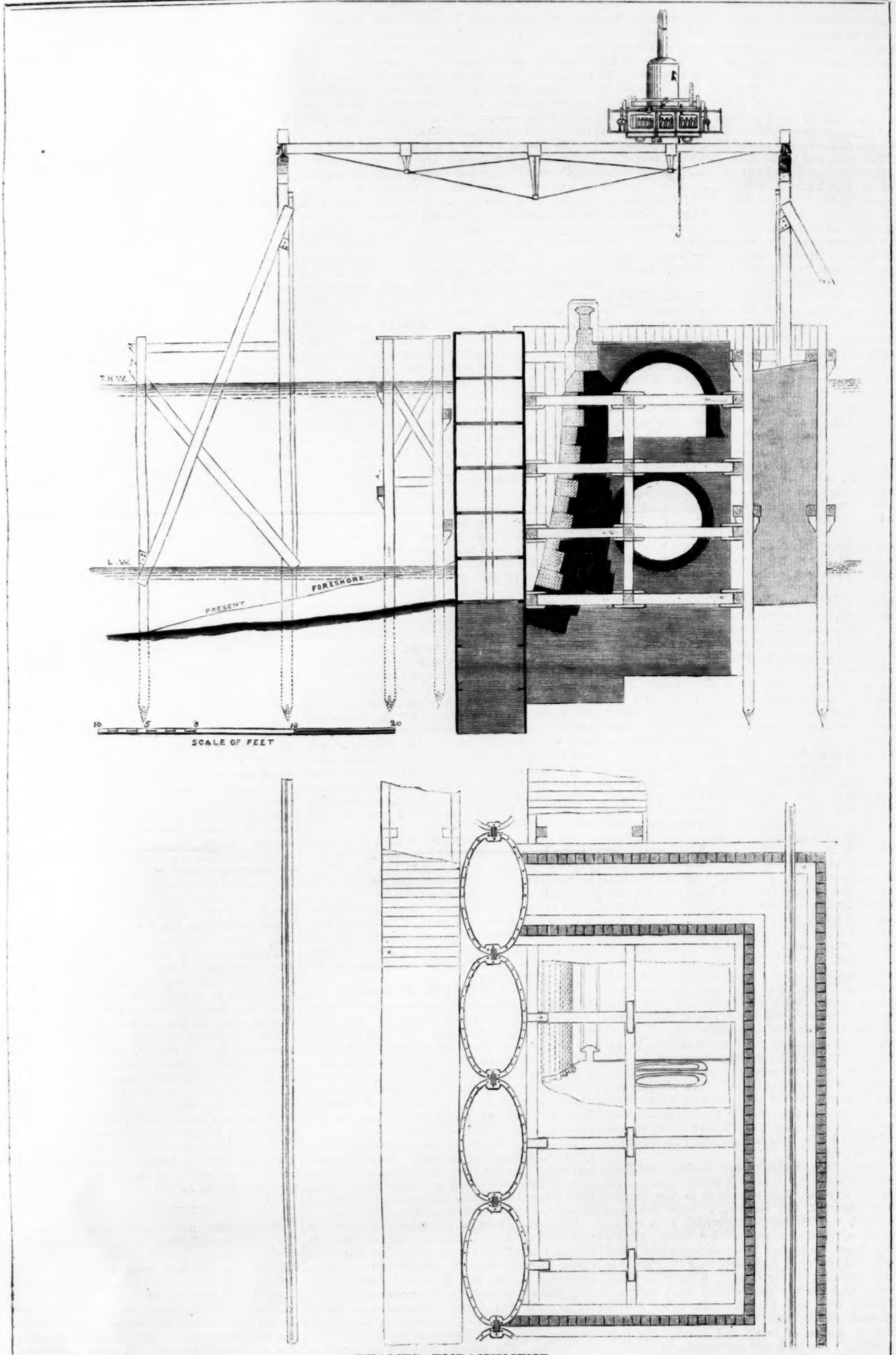
On the morning of the 6th, at five, the signal-gun was fired for sailing, after a stay of three clear days: as we got under weigh, we had another fine view of the harbour and the surrounding scenery; the sun rose resplendently, the east indicating another intensely hot day; that, with the sombre-looking mountains in the background, the shipping, a brig getting under weigh with all sails set, the picturesque houses of the town, the heavens presenting almost a cloudless aspect, with the exception of a few light fleecy-looking clouds to dim the azure canopy of heaven—presented a view of surpassing beauty worthy of the pencil of a painter or the theme of the poet.

On the 10th, Sunday, had divine service on board; and while we were at dinner Swan Island was announced as being in sight. It appeared to be unoccupied, except by a solitary fisherman, and is covered with trees and mangrove bushes. The Americans, I was informed, had planted their "stars and stripes" upon it; but what they intend to make of it I do not know, except as a depôt, from which they can at some future day intercept our Central American trade.

The Americans are very jealous of our possessing territory in Central America, and it was through their repeated protests that the Bay Islands (the rendezvous for General Walker and his fillibusters) were given up. On the 12th, we made half-moon Kay and the lighthouse, recently erected of iron at a cost of 2,100*l*., the contractor stating that he lost 400*l*. by the contract. It is 76 feet high, and is seen about sixteen miles distant; but notwithstanding that, wrecks frequently occur on the adjoining coral-reef. It is about sixty miles from Belize.

B. C. E.

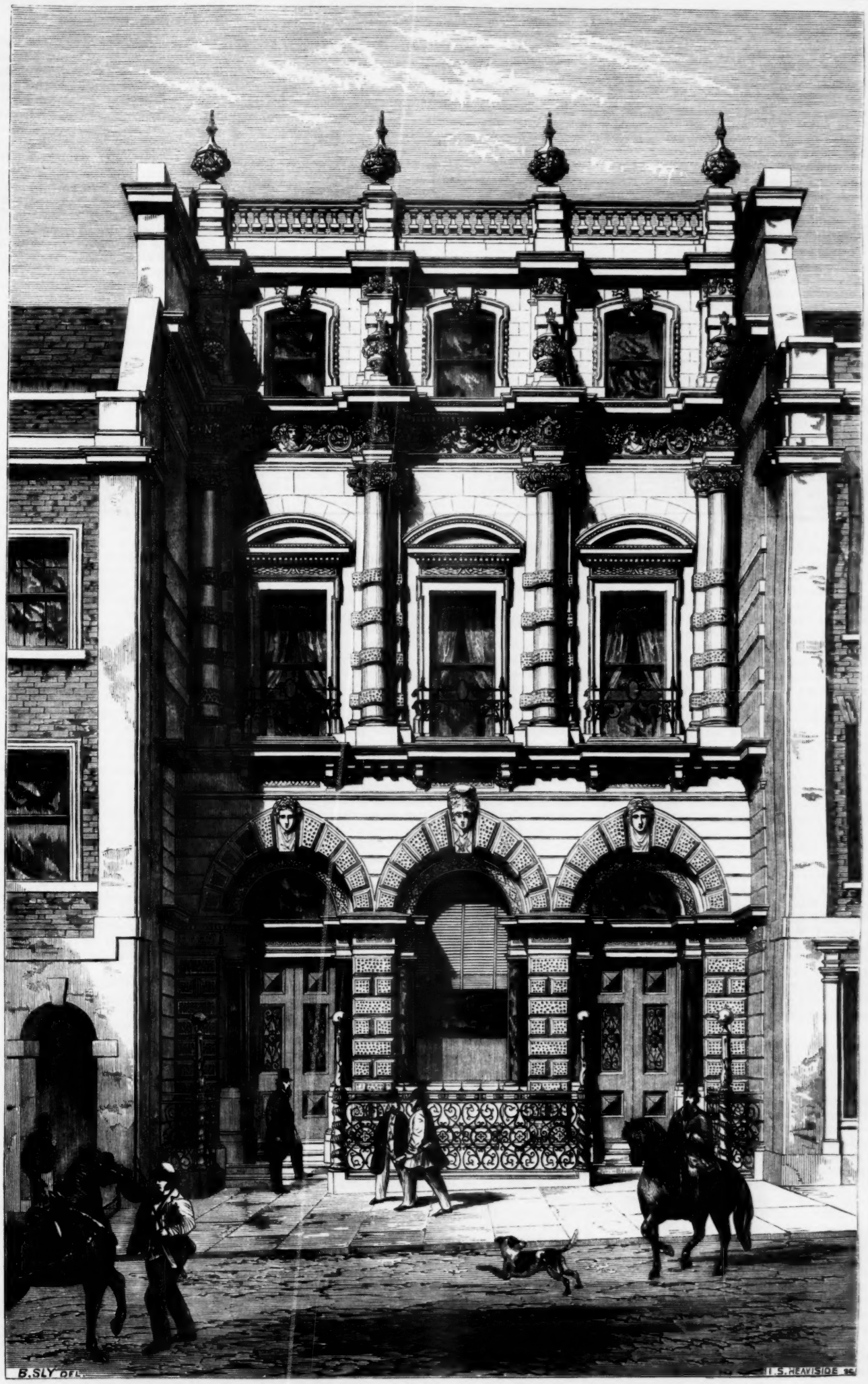
Steam Saw-mills destroyed by Fire. — In the Talbot-road, Ledbury-road, Paddington, the extensive range of premises belonging to Mr. W. Hide, steam saw-mill proprietor, have been burnt. The mills covered a space of ground nearly 100 ft. long and 40 ft. wide. The flames could not be extinguished until the mills were destroyed, as well as the machinery and stables, and the back part of the private residence is also seriously damaged. A charge of incendiarism has grown out of the destruction of the mills. At the Marylebone Police-court, a man who was employed as a labourer there has been accused of the offence.



THAMES EMBANKMENT.

Plan and Section: Coffer-Dam used in laying the Foundation Stone; Retaining-Wall, Sewer, and Sub-way; and Caissons forming the Front of the general Coffer-dam Construction in the First Contract.

See p. 573, *ante*.



NATIONAL PROVINCIAL BANK OF ENGLAND, CORN STREET, BRISTOL.

MR. W. BRUCE GINGELL, ARCHITECT.

NATIONAL PROVINCIAL BANK OF ENGLAND, BRISTOL.

The façade is in the Italian style, and though of small dimensions, is bold and effective. The frontage was set back by the Improvement Committee for the future widening of the street; and in order to obtain light for some of the lowest rooms, the façade has been recessed 4 ft. further, and the architectural lines are returned upon the party walls, thus giving additional importance to the frontage. The sunk area will be surrounded with iron palisading and standards, upon a moulded kerb of blue pennant stone, with folding gates before each doorway.

The basement story stands upon a moulded plinth of blue pennant stone, and presents three sunk arched recesses, the piers and voussoirs being decorated with moulded and vermiculated rustics; the arches springing from a denticulated entablature, having an enriched fret upon the frieze, and each keystone being sculptured into a female head. The side recesses are doorways having coupled Doric columns of Aberdeen red granite, highly polished, and standing on pedestals of rubbed blue pennant stone, the capitals and bases of the columns being of Bolsover stone, and enriched with guilloches, &c. The centre recess is a window lighting the front consulting-room. At the first-floor level is a bold entablature with a block cornice, broken before each window to carry ornamental iron balconies.

The principal story presents four three-quarter Ionic columns engaged to piers wrought as quarter-pilasters each side; the group having moulded and vermiculated rustics thereon for about two-thirds of the height, and finishing with carved capitals. The spaces between the piers contain three windows, with architraves and circular pediments, with enriched mouldings and panelled friezes filled with laurel-leaves and bands. Above the columns is a denticulated entablature, broken over with columns and pilasters, certain mouldings being enriched, and the frieze carved and sculptured, forming one of the most prominent features in the design. In this ornamentation the title of the company has been indicated—the central compartment showing a bust of her Majesty the Queen, with medallions on each side bearing the plume and motto of the Prince of Wales, the background having the sceptre and mace, and the paddle and anchor, crossed in pairs; the whole connected with ribands and swags of fruit and flowers. In the dexter compartment is a bust representing "Peace." The sinister compartment has a bust representing "Plenty." Upon the cornice over each break stands a vase, adding materially to the importance of the principal story in the façade.

The attic has three windows, with moulded and enriched architraves and carved keystones; and between the windows are piers, corresponding with the breaks below, all rusticated, and supporting a small entablature, having carved swags of flowers over the piers, and terminating with a balustrade and pedestals, whereon stand four vases.

The whole of the façade, except where granite and Pennant stone has been used, is executed with Combe Down and Box weather stone.

From the street a corridor is entered, the walls being finished with Corsham stone, and divided into four compartments by piers, having rusticated pilasters thereon, with carved capitals; above which is a denticulated entablature breaking over the piers and pilasters, and continued through the side recesses. The entablature forms an impost, from which springs a vaulted ceiling, with semicircular moulded and panelled beams across the bays and over the recesses, with riband and berry enrichments and panelled fans, each compartment finishing in a circular flat panel, with enrichments and a centre flower.

Passing through large folding glazed doors, a vestibule is entered, also finished in Corsham stone, and having recesses, with moulded and panelled dado all round, and denticulated entablature. The ceiling is coved and groined. This vestibule is lighted by a large top light, and will be glazed with ornamental tinted glass, of an azure ground with white and gold diaper and purple interlacing border.

From the vestibule large glazed doors lead into that part of the banking-room which will be devoted to the public before the counter; and this is in itself an ante-room, executed with Corsham stone, and having moulded dado and denticulated entablature all round, with three large recesses, over which are semi-elliptical archivolts. The plaster ceiling is in formedto a square compartment, by moulded beams, enriched with oak-leaves and bands, from which it is coved down to the stone entablature, the coves being diapered with moulded lozenges, each filled in with a set flower.

The banking-room is 38 ft. square and 30 ft. high, exclusive of a semi-circular apse at the north end, over which is a large semi-dome light. Corsham stone is used for the finished surface of all parts up to the ceiling. A moulded dado runs round the room, above which are coupled pilasters, each wall space being divided into three compartments, the centre being double the width of the side ones.

The ceiling is executed in plaster. Coupled panelled beams, corresponding with the pilasters and filled in with laurel leaves, run across from each side and form a square central compartment, out of which rises a dome light 15 ft. in diameter; the circular vertical space between it and the flat ceiling being divided into eight parts, with curved moulded panels, having rosettes and swags and drops of flowers over and between the same, and laurel enrichment round the opening.

Around the dome-light the ceiling forms four large semi-circular openings, each enriched with laurel-leaves and mouldings, and having therein a flat light, divided into eight panes by moulded radiating bars. The dome, semi-dome, and four flat lights are glazed with ornamental tinted glass of an azure ground, with gold and silver stars, and purple interlacing borders.

In the apse, stone stairs lead to the repositories, which are divided into separate cash, plate, and deed safes, fitted up with iron shelves, warmed and ventilated, and furnished with thief-proof iron doors and gates.

In addition to the business part of the premises, a dwelling-house is provided, suitable for the residence of a manager.

The whole of the structure is fireproof, upon the system patented by Messrs. Fox & Barrett, all the floors and roofs being formed with rolled-iron joists, carrying concrete finished with cement surfaces to rooms and asphalte to roofs.

All the floors in the business part of the premises are paved with ornamental tiles, by Messrs. Maw & Co.

The carving and sculpture, and the models for the enrichments, have been executed from the architect's designs by Mr. T. Colley, of London.

The building has been warmed and ventilated by Messrs. Haden & Son, of Trowbridge.

The general contractor was Mr. J. Broad, and his sub-contractors were Messrs. Lewis & Sons, plasterers; Osborne, plumber; Browning, painter; J. Harris, joiner; A. Harris, smith; and Swinburne & Slater, glaziers. Mr. Pilkington, of London, executed the asphalte work.

The architect was Mr. W. B. Gingell, of Bristol, who designed the West of England Bank and the General Hospital. Mr. W. Long, who was clerk of works at the General Hospital, under the same architect, has performed similar duties at this building.

THE CRIMEAN MEMORIAL AT NETLEY.

His Royal Highness the Prince of Wales has laid the chief stone of a memorial to the medical officers who fell in the Crimea. The site of the memorial at Netley Hospital is immediately in front of the medical officers' quarters, a little to the southward of the hospital. When completed, the monument will be a prominent object seen from the Southampton Water. It will be erected from the designs of Mr. T. H. Lewis, and will be carried out by Messrs. Myers, by whom Netley Hospital and the surrounding buildings were erected. The memorial will be a cross, in the style of the early part of the thirteenth century, and will be 56 ft. in height to the top of the cross, and below will be a series of arches, forming an octagonal arcade, supported by columns of marble and Portland stone. There will be a lower arcade, in which will be placed a number of tablets, on which will be inscribed the names of those medical officers who fell during the whole of the Crimean war in the performance of their duty.

In reply to an address by Colonel Wilbraham, previous to laying the stone, the Prince very gracefully expressed the interest felt in the memorial, as in the hospital, by the Queen and by himself, and alluded to the interest with which it was also regarded by the Prince Consort.

SHALL NOT SHAKSPEARE HAVE A NATIONAL MONUMENT?

The inhabitants of New York, notwithstanding their present troubled condition, have set an example to London in raising funds, seemingly with very little trouble, for the purpose of rearing an important monument to the memory of Shakspeare. In a pecuniary point of view, especially, the result of the Tercentenary celebration in England has been very unsatisfactory. Even at Stratford-on-Avon, there will not be any other monument to the great poet than the church of the Holy Trinity. But what, we have already asked, could be more fitting for its purpose than this noble shrine? As to the causes of failure, it must be admitted that one was the flow of a large amount of the public enthusiasm and excitement into another channel. There was, however, too much attempted; and, instead of the whole country concentrating its energies with a view towards the erection of one national monument, worthy of the poet, many towns set up a rivalry, and endeavoured to raise money for the purpose of erecting memorials in their own several localities. Even in London the councils were divided: there was no harmonious action; and notwithstanding the long array of influential names of persons who were willing to assist in the realization of a metropolitan monument, the matter was never brought with business-like energy before the general public.

The question now is, are we to be entirely disheartened by this failure? are we to despair entirely of being able to rear a national and central monument in honour of Shakspeare, on a proper site *in London*, which was for many years the field of the poet's active life? for it should not be forgotten that if Stratford-on-Avon had the honour of being the place which gave the poet birth, to which he retired after his life labours, and where his ashes rest, it was in London that most of his marvellous works were produced, and where his fame was established.

It is very desirable that another attempt should be made by this generation to do him honour; and although at the commencement such an endeavour may not be attended with much enthusiasm or highflown hope, it may end in more effectual results. With restored confidence on the part of the public, it does not seem likely that there would be much difficulty in gathering together, at a suitable season of the year, an influential meeting at which a considerable sum would be subscribed; and the matter once set properly moving, money for this purpose might be obtained from many sources,—not only from persons of rank, wealth, and education, but also from the great masses of the people.

But besides the public, it seems clear that the Government has also a duty to perform in connexion with this memorial. To aid in honouring the memory of eminent men, large grants have been made from time to time out of the national exchequer. In this way the exertions of the warrior, the statesman, the philosopher, and man of science obtain recognition; but to few other English worthies do the people and the governing powers owe so great a debt of gratitude and admiration as to the immortal bard of Avon.

Many who take a great interest in the erection of a national monument to Shakspeare, have complained that they were in the dark as to the present position of affairs, and have asked if there were any or what available funds which might be made the gathering point of a general subscription; and if there were an active and responsible executive committee still in existence? It is satisfactory, therefore, for us to be able to state that the executive committee have announced that the balance of the subscription-list amounts to the sum of 1,280*l.*, after deducting the expenditure, which was 970*l.*; and that they unanimously make the explicit proposal to the subscribers and the public, that this balance be now invested, with a view to its increase, till the Thames Embankment shall have been formed, when a noble and appropriate site for a memorial may be secured near the Temple Gardens; or they may again try for St. James's Park, which we should prefer.

It is still to some extent unfortunate, however, that two metropolitan schemes simultaneously offer themselves; and it would be very desirable that some means should be taken to amalgamate these two into one. The working men's Shakspeare committee propose a national penny

subscription to erect a monument on Primrose-hill, *or elsewhere* in the metropolis, to consist of a marble statue, 10 ft. or 11 ft. high, besides the pedestal, and to cost 1,500*l.* with an iron and glass ornamental shrine for its inclosure, to cost 1,000*l.* more; the sum total to be raised by 600,000 penny, 100,000 sixpenny, or 50,000 shilling subscriptions.

The working men's committee have thus the advantage of the—rival committee, must we call it, in point of explicitness and definite objects in view. Could the one committee only be induced to adopt the views of the other, we have little doubt but that the joint committee, or the two co-operative committees, would soon have the pleasant need to re-consider and extend the idea of the resultant monument, from sheer superflux of funds.

ST. PAUL'S CHURCH, WOKINGHAM.

The new church of St. Paul, Wokingham, built by Mr. Walter, M.P., has been consecrated by the Bishop of Oxford.

The edifice, which stands on a site of two acres, intended as a burying-ground for the new district, is in the Decorated style of the fourteenth and fifteenth centuries. It forms a conspicuous feature in the landscape, and in plan comprises a chancel, a nave, a vestry and organ-chamber, and a tower with spire 170 ft. in height.

The entrance to the church is under the tower, which is placed at the north-west angle. The doorway is deeply recessed and richly moulded, the face of the inner portion being covered by diaper work with running foliage in the mouldings. The tower, which is about 20 ft. square at the base, has angle buttresses and two tiers of grooved and foliated pinnacles with flying buttresses to support the spire. It is pierced by two tiers of windows. The tower is surmounted by an open traceried parapet, the panels being filled in with carved work and foliage. From this springs the spire, which is built entirely of Bath stone. The nave has an arcade of six arches on either side. Above runs a clerestory of six windows on the south and five on the north side.

The roof of the nave, about 50 ft. in height, is open-timbered, plastered between the rafters, and finished with a light blue tint. The aisles of the nave are lighted by six windows on either side, filled with traceried heads. The roof of the aisles has arched and moulded principals. The nave is lighted by a west window, about 24 ft. high, with moulded jambs and traceried heads. The chancel is entered under a moulded arch enriched with double wreaths of roses and foliage. On either side of the chancel there is an arcade of two arches. The organ is placed within the arcade on the north side. The arcade on the opposite side forms the founder's private chapel. The east window has reticulated tracery of two orders, with richly polished bordering, the mouldings being deeply recessed. There are two windows on the north side of the chancel, having each two lights, with moulded and traceried heads. The chancel has a clerestory on the south side of four windows. The altar is approached by five steps. Under the east window is a recessed and carved arch, flanked on either side by buttresses, surmounted by carved and fluted pinnacles entirely composed of roses. Above the arch runs a moulded, carved, and embattled cornice, the whole width of the chancel, the spandrels above the arch being filled in with tracery. The background is composed of alabaster. The reredos is executed in Caen stone. The altarpiece, carved in alabaster, in two panels, represents the Last Supper and the Crucifixion. The chancel is paved throughout with Minton's encaustic tiles; the aisles with Minton's and Poole tiles intermixed.

There is no gallery in the church. The pews, of deal stained and varnished, are open. The windows are filled with stained glass by Hardman, of Birmingham. The east window represents the Transfiguration; the west, the Conversion of St. Paul. The north and south aisles windows are emblazoned with subjects from the life of St. Paul. The architect was Mr. Wodyer, of Graffham, near Guildford; and the work has been superintended by Mr. G. Redfern, his clerk of the works. The builders are Messrs. Wheeler & Sons, of Reading. The heating apparatus was by Messrs. Haden & Sons, of Trowbridge. The sculpture and carving have been executed by Mr. T. Nicholls, of Lambeth. The organ was by Willis. The bells, eight in number, were by Messrs. Warner & Sons, of London. The tenor bell sounds note F, and the weight is 17¼ cwt. The weight of the whole peal is 75 cwt. The bells are hung in a cast-iron frame, which is said to answer very well. By using iron they get over the shrinkage of the timber during the summer time, which often causes much trouble. Messrs. Warner have also by this means been able to hang this peal of eight bells all on *one level*, in a chamber 12 ft. 7 in. by 12 ft. 7 in.

The walls of the church externally are built of Bristol blue stone, with dressings of Bath stone. The wall inclosing the ground on the north side is built of the same materials.

BUILDERS' BENEVOLENT INSTITUTION.

The seventeenth annual general meeting of the friends and subscribers to this institution was held on Thursday, the 28th ult., at the London Tavern, Bishopsgate-street, for the purpose of receiving the report for the past year, for the election of president, auditors, and other officers in connexion with the conduct of the institution. Mr. Alderman James C. Lawrence, the president, occupied the chair. Among the gentlemen present were, Mr. George Plucknett (treasurer), Messrs. Joseph Bird, T. Cozens (the founder), R. Head, R. Watts, J. Thorn, W. Hutchons, W. S. Simkin, T. Stirling, W. H. Cooper, M. Hall, T. Howard, and several other gentlemen connected with the various departments of the building trade.

The chairman, having referred to his connexion with the Builders' Benevolent Institution through the introduction of Mr. Lee, a former president, and his admiration of its conduct and principles, expressed his gratification at its present position, believing it to be one that deserved support for the general charity which it set forth to bestow on those who, from old age or other circumstances, became necessitated and required its assistance. He concluded by requesting Mr. Harris to read the report.

The secretary then read the following report:—

"In presenting to the supporters of the Builders' Benevolent Institution the annual report for the past year, the directors have the satisfaction to inform them that there has been an increase in the annual subscriptions, likewise to the stock purchased in the Three per Cent. Consols.

The increase in the annual subscriptions beyond last year amounts to 37*l.* 5s. 6d., while 921*l.* 10s. 4d. has been added to the Stock account; making the sums now standing in the names of the trustees 7,332*l.* 11s. 10d. for the relief fund, and 2,529*l.* 18s. 6d. for the building fund, being a gross total of 9,862*l.* 10s. 4d. stock Three per Cent. Consols.

Since the last general meeting the directors have to acknowledge the sum of 50*l.* bequeathed to the institution by James Faulkner, esq., late of Somerset Villa, North Lee Park-road, Kent; and a donation of 100*l.* from Mrs. Cubitt, of Denbies, Dorking, Surrey; and the directors take this opportunity of publicly expressing their best thanks to Mrs. Cubitt for her kind and generous gift in aid of the funds of the charity, and their expression of gratitude for the bequest of the late James Faulkner, esq.

Eight pensioners have been elected, viz., five males and three females; and eight pensioners have died during the past year, four males and four females, which enables the directors to announce to the subscribers and donors that the funds of the institution justify another election in November next. The male pensioners elected were, in November, 1863, W. Standfast and W. Goodwin; and in May, 1864, R. Langstaff, J. Jenkins, and W. H. Walsham. The females elected were as follows:—In November, 1863, C. A. Deacon; and in May, 1864, E. Efford and S. Clements. The male deceased pensioners are A. Richards, elected November, 1855, died October, 1863; W. Goodfellow, elected May, 1860, died December, 1863; W. Williams, elected November, 1856, died February, 1864; and W. Palmer, elected November, 1861, died May, 1864. The females are—E. Wood, elected February, 1853, died July, 1863; S. Wright, elected May, 1862, died August, 1863; A. Fould, elected November, 1849, died September, 1863; and M. Furrian, elected May, 1859, died May, 1864.

The annual ball, under the kind superintendence of the honorary secretary, Mr. Joseph Bird, realized a profit to the institution of 103*l.* 14s.

In recording the transactions of any charity where the objects sought to be accomplished are unvarying and confined to the trades engaged in building operation, there must necessarily be a similarity in the annual reports, the most gratifying fact to communicate being the progress obtained. This the directors of the Builders' Benevolent Institution have the satisfaction of announcing to their supporters; and they hope, both by recommendation and personal influence, the promoters of the institution will endeavour to increase their funds, and thereby extend their sphere of usefulness.

Appreciating the kind and efficient services rendered to the charity by the president of the institution for the past year, the directors have the pleasure to announce that Thomas C. Lucas, esq., has kindly consented to become the president for the year ensuing."

The reception of the report was then put to the meeting, and unanimously adopted.

The president, Mr. Thos. C. Lucas, was then elected, as were also the various officers for the effective performances relative to the welfare of the institution.

The usual complimentary votes concluded the proceedings.

ROYAL PARKS AND GARDENS IN ENGLAND IN 1738.

At a time when a stir is being made in and out of Parliament, touching public parks, gardens, and thoroughfares,—their abridgment and their enlargement,—the following royal sign manual warrant, now first published (George II. king), in which the dimensions of several of them are laid down to a nicety of acres, roods, and poles, will be read with interest. Possibly some reader of the *Builder* who is skilled in measuring land (and the *Builder* must have many so accomplished) will kindly compare the parks as they exist in 1864, with the parks as they existed in 1738.

Charles Bridgman died of a dropsy at his house at Kensington, on the 19th July, 1738, and Henry Wise (London & Wise), at Warwick, on the 15th of December in the same year. What became of their papers, plans, &c.? They must have been both curious and abundant. Wise, it was said, died worth 200,000*l.*! Who was Samuel Milward? John Kent was no doubt a relative of William Kent, the architect.

Peter Cunningham.

"George R.

Whereas, we are minded that our Royal Gardens at St. James's and at Kensington, which, with the rest of our Royal Gardens, were lately under the conduct, care, and maintenance of Charles Bridgman, *deceased*, shall for the future be severed from the rest of our said Royal Gardens, and be under the conduct, care, and maintenance of a person specially to be appointed for that service, and accordingly we are graciously pleased to nominate and appoint Samuel Milward to be our chief gardener of our said Royal Gardens at St. James's and Kensington, which contain 172 acres, according to the particulars thereof hereunder specified,—that is to say:—

	a.	r.	p.
At St. James's.			
The Garden	1	3	11
At Kensington.			
The Old Gardens, from the greenhouse down to the road	17	1	22
The new plantation, kitchen-garden, coach-court, and piece before the stoves	38	0	
The new paddock, with all the walks, lawns, wood, and other quarters contained therein, together with 8a. 2r. 32p. of gardening, called Bays Water Gardens, some time since purchased of — Seymour, esq.	114	3	7
Making in the whole	170	0	29
	172	0	0

And we are further graciously pleased to grant and allow that the said Samuel Milward shall have and receive after the rate of 15*l.* per acre for the whole charge of keeping, maintaining, and upholding the said 172 acres in the manner and method prescribed by the scheme executed under his hand and seal, which is hereunto annexed, and that the said allowance of 15*l.* per acre, which may be reckoned to amount to the sum of 2,580*l.* by the year, shall commence and be accounted payable unto him from the day of the death of the said Charles Bridgman exclusive; and we are further graciously pleased to grant and allow that the several garden-houses, sheds, and places heretofore used and possessed as belonging to our Royal Gardens afore described, shall be had, taken, used, and be, and remain in the possession of the said Samuel Milward, for the use of himself and servants during his continuance in the said office of chief gardener. And, moreover, our will and pleasure is, and we do hereby authorise, direct, and command you to pay, or cause to be paid, unto the said Samuel Milward or his assigns, by the hands of the 'paymaster of our works' for the time being, the said yearly sum of 2,580*l.*, from the day of the death of the said Charles Bridgman, as aforesaid, by quarterly or other payments, as you shall think fit, for and in consideration of his service, care, pains, and expenses in ordering, maintaining, and keeping up our Royal Gardens afore described, according to the terms, conditions, and agreements in the said scheme contained. And our further pleasure is, that this our warrant, and the scheme thereby referred to, be entered with the 'Surveyor of our Gardens,' to the end he may have full cognizance thereof, and take care, from time to time, that the said Samuel Milward do well, truly, and effectually comply with, execute, and perform the said scheme in all things thereby stipulated; and that we be not burthened with any expenses relating to our said Royal Gardens, contained within the said ad-

measurement as aforesaid, other than such as by the said scheme are agreed to be borne and defrayed by us; and that the said warrants and scheme be also entered in the 'office of our Works,' to the end of the officers of 'our Board of Works' may strictly regard our service in all things appertaining to them: and for so doing this shall be your warrant. Given at our Court at Kensington, the 17th day of August, 1738, in the twelfth year of our reign.

By his Majesty's command,
R. Walpole,
Sundon,
T. Winnington.

To the Commissioners of our Treasury."

"George R.

Whereas, we are minded that our Royal Gardens at Windsor and New Market, which with the rest of our Royal Gardens were lately under the conduct, care, and maintenance of Charles Bridgman, deceased, shall for the future be severed from the rest of our said Royal Gardens, and be under the conduct, care, and maintenance of a person specially to be appointed for that service; and accordingly we are graciously pleased to nominate and appoint John Kent to be our chief gardener of our said Royal Gardens at Windsor and New Market, which contain 6a. 3r. 16p., according to the particulars thereof hereunder specified,—That is to say:—

At Windsor.	a.	r.	p.
The Kitchen-garden	0	0	33
The Fruit plantation next the wall in Mastrick*	2	3	30
The little House-garden	3	0	33
	6	1	16
At New Market.			
The Gardens	0	2	0
	6	3	16

And we are further graciously pleased to grant and allow that the said John Kent shall have and receive after the rate of 15*l.* per acre for the whole charge of maintaining, keeping, and upholding the said 6a. 3r. 16p. in the manner and method prescribed by the scheme executed under his hand and seal, which is hereunto annexed, and that the said allowance of 15*l.* per acre, which may be reckoned to amount to the sum of 102*l.* 15s. by the year, shall commence and be accounted payable unto him from the day of the death of the said Charles Bridgman exclusive. And we are further graciously pleased to grant and allow that the several garden-houses, sheds, and places heretofore used and possessed as belonging to our Royal Gardens afore described shall be had, taken, used, and be and remain in the possession of the said John Kent, for the use of himself and servants during his continuance in the said office of chief gardener. And, moreover, our will and pleasure is, and we do hereby authorize, direct, and command you, to pay, or cause to be paid, unto the said John Kent, or his assigns, by the hands of the 'paymaster of our works' for the time being, the said yearly sum of 102*l.* 15s. from the day of the death of the said Charles Bridgman, as aforesaid, by quarterly or other payments as you shall think fit, for and in consideration of his service, care, pains, and expenses, in ordering, maintaining, and keeping up our Royal Gardens afore described, according to the terms, conditions, and agreements in the said scheme contained. And our further pleasure is that this our warrant and the scheme thereby referred to be entered with the 'surveyor of our gardens,' to the end he may have full cognizance thereof, and take care from time to time that the said John Kent do well, truly, and effectually comply with, execute, and perform the said scheme in all things thereby stipulated; and that we be not burthened with any expenses relating to the our said Royal Gardens, contained within the said admeasurement as aforesaid, other than such as by the said scheme agreed to have been borne and defrayed by us; and that the said warrant and scheme be also entered in the office of our Works, to the end the officers of our Board of Works may strictly regard our service in all things appertaining to them: and for so doing this shall be your warrant. Given at our Court, at Kensington, the 17th day of August, 1738, in the twelfth year of our reign.

By his Majesty's command,
R. Walpole,
Sundon,
T. Winnington.

To the Commissioners of our Treasury.

* A place so named by the Duke of Monmouth, and much ridiculed at the time and long after.

CHARING CROSS RESTORED.

An enthusiastic correspondent expresses wide wonder that we have not, "like all the rest of the press," praised the Charing Cross Hotel Company's "pretty idea" of setting up a restoration of Charing Cross (the cross of the *chère reine, perhaps*), in front of their hotel. Well, the fact is, we are not bound to speak of everything; and as we are unable to go with "the rest of the press" in this instance, we were contented to say nothing. It seems to us a mistake in two ways; pretty as the idea is. If Charing Cross is to be restored it has no business on this spot, unless it is to be regarded merely as a sign; and in the next place it is filling up space where there is none to spare, and will be found a nuisance before long. It will doubtless be done well: the name of the architect directing it is sufficient assurance of that; but, like the Wellington Clock Tower at London Bridge, its removal is merely a question of time.

ART-EXHIBITION AT MALINES.

An Exhibition of Works of Art, of the Mediæval and Renaissance periods, on loan from churches, convents, corporations, guilds, and private collections, will be held in Malines, to open on the 29th inst., and close on the 25th September. It will form the richest collection of works of Flemish art, we understand, ever yet brought together. Very many of those belonging to convents are not to be seen without great difficulty at other times. The practical carrying out of the Exhibition has been entrusted to Mr. Weale, of Bruges, who is also charged with the editing of a catalogue, divided into ten sections, each arranged chronologically. M. Edouard De Bleser is the secretary.

RACE-STUD-STABLES AT NEWMARKET.

An extensive range of stables for the accommodation of race-horses is about being built, under the direction of the Newmarket Hotels Company, who have commenced operations, and obtained possession of the Rutland Arms Hotel and land adjoining. The first block of buildings will consist of about 100 loose boxes and stalls, with residence for stable groom, coach-houses, granaries, boys' dormitories, drying room, boiling house, lavatories, and other conveniences, to render the establishment complete. The loose boxes are planned 18 ft. by 10 ft. and 13 ft. high, the stalls each 6 ft. 3 in. wide and 18 ft. deep. The whole are ventilated, and drainage is provided. The water supply will be formed by collecting the rain-water from the roofs in four large reservoirs, with filtering apparatus, and pumped up at different points as required. The mangers, fittings, division-heads, and sills, will be of iron enamelled, and will be constructed especially for these stables by Messrs. Johnson, Bros., of London. The total cost will be about 10,000*l.*, and there is little doubt they will bring income to the company, as superior accommodation is much wanted in this training nursery for English race-horses.

Plans have also been prepared for the entire remodelling and additional accommodation and improvements at the Rutland Arms Hotel.

The works are being carried out under the superintendence of Mr. John D. Ellis, architect, London.

RAILWAY REFORM.

THE TRIM OF TRAINS IN TRANSIT.

The two modes of ensuring something like safety to passengers, to which we lately drew attention as probably the best on the whole which can be suggested, namely, either a regular watchman's beat along the train, or, short of that, glass compartments, have both been adopted by the Board of Trade in a circular just issued to the secretaries of railways. In this communication the lords of the committee of Privy Council for Trade, by their secretary, Mr. Booth, say:—

"Several expedients have been suggested as calculated in some degree to further the desired object.

One expedient for guarding against offences in railway-carriages which has been proposed, is that of placing windows between the compartments of each carriage. As these windows might be provided with curtains (?), the privacy of the carriages need not ordinarily be interfered with.

As an expedient for providing means of communication between the *guard* and the *passengers*, it has been suggested that every vehicle forming part of a passenger train should be furnished with a footboard and handrails, which would admit of the guard (or, in case of emergency, other persons) passing along the train.

It appears to my lords deserving of consideration whether this expedient, guarded, of course, by carefully-framed regulations to prevent abuse, might not be generally adopted with very beneficial effects.

The use of a cord running along the train, by means of which the *guard* can attract the attention of the *engine-driver*, has now existed on some lines so long as to prove that there is no difficulty in *its* application.

I am to request that my lords may be favoured with the opinion of the directors as to the practical value of arrangements of the nature specified, and also with any suggestions which the directors may think adapted to accomplish the ends which my lords have in view.

I am also to request that my lords may be informed what means are in practice on your line for effecting communication between different portions of a train while in motion."

It is to be earnestly hoped that this communication will lead to a complete reform in the present mal-arrangements. Indeed, something *must* be done. The public will not submit any longer to be robbed and murdered merely that the pockets of railway shareholders may be spared. Should railway directors refuse to do anything effectual now, they may find themselves in the not very pleasant predicament of being charged with being accessory before the fact to some of those grave crimes which are only rendered possible by their inexcusable neglect to provide the public with the sure means of preventing them.

Before many years have passed, indeed, the working management of our railways must be greatly changed and improved in more ways than one in order to prevent a large and increasing loss of human life and damage to human limbs. To a remarkable extent the railway system is spreading in all directions, and the spaces which at one time were thought far more than sufficient for any traffic which might be required at termini, stations, and junctions, are now found to be dangerously restricted. In many instances the chief stations have become crowded scenes of confusion, and the junctions places of extreme danger; take, for instance, the Stepney junction on the North London Railway, through which the trains run to and fro in various directions with startling rapidity (we would like to know how many trains pass the platform in a day, and the average number of minutes which elapse between each). It is clear to the most casual observer, that, in order to prevent some terrible calamity, everything depends upon the vigilance of two or three persons: a single instance of want of carefulness or watchfulness on their part, or the least failure in the signals, must inevitably lead to serious damage. We are bound to say, however, that this station seems to be managed with both ability and watchfulness; and that the master, in his activity and politeness, is a sort of Palmerston of station-managers. It is satisfactory to observe throughout the length of this line, the improved civility of all the officials—since, in years past, we were obliged more than once to complain of want of attention and rudeness of manner. The announcement of the various stations is also far more distinct than formerly. But it is not specially with those who have direction of railway traffic that we have now particularly to do: it is rather with the general system, which causes congestion and confusion at so many points,—which, in an ill-judged spirit of economy, causes one junction or station to be applied to far too many uses, and prevents the introduction of necessary alterations in carriages and signals. The underpayment and overworking of those *employés* to whom, in the present state of affairs, the lives of the public are mainly intrusted, is another point urgently needing reform.

When glancing at the growth of the English railways, it is worth while to remark, that all the arrangements were in a great measure the result of chance, and the offspring of necessities which were developed by degrees, as an entirely new plan of conveyance was brought into working trim. Just as the noblest orders of our architecture are the development and improvement of the simple and rude wooden houses of antiquity, so the carriages, &c., on our railways are the promptings of peculiar requirements, which however, in principle, have been but little changed. When George Stephenson planned the Stockton and Darlington Railway, it was intended almost entirely for the conveyance of coal and other minerals. It was little thought, in those days, that the railway would supersede the stage-coach in the conveyance of passengers; but when this line was opened, workpeople and persons going to and fro on market-days, availed themselves, in the first instance, of a

passage on the trucks, without payment. The demand for this manner of travelling suddenly increased, and a charge was made; but, for a long time, there were not even covered carriages for passengers, although for goods which required care covered vans were provided, which were made without any attempt at ornament or the picturesque in form. They were simply large boxes made of sufficient strength to suit the intended purpose; and even now the chief part of the railway passenger-carriages have been but little changed in their general plan. In England, where the railway system was originated and brought into working order, the arrangement of the carriages is not so good as in many places abroad where improvements on our more antiquated system have been made. Here we, by chance, were led to adopt a plan of the moment, and have stuck to it, repudiating improvement. It is to this that attention should now be especially directed: the various incidents which have excited the public notice during the last month or two, show the necessity for this; and the pages of the newspapers contain all kinds of suggestions of means for meeting the evil. The chief difficulty seems to be the cost which would be required to alter the carriages now in use, or to replace them with those of a better construction; but, as we have said, something *must* be done; and it is to be hoped the Board of Trade will persist in the effort to induce railway directors to do what is so urgently requisite.

Sir,—The adoption of curtains in the carriages of the South-Western Railway to the glass panels which were proposed originally in your journal, appears to me to be quite unnecessary, and in some cases would destroy the whole proposition. For instance, in a second-class carriage there are four compartments: suppose there was a commotion in one of the middle compartments, the two adjoining ones might be empty, and then the passengers in the other could not see through because the curtains were drawn. The public had much better give up a little privacy for the sake of greater security. A. R.

ST. DAVID'S CATHEDRAL.

Renewed efforts are now being made to obtain funds for the reparation of the tower and the restoration of the choir. The tower is in a very dangerous condition, as may be judged of from the following passage in a report made by Mr. Scott in 1862, on which the chapter are now seeking to act:—

"The present condition of the tower is in the highest degree alarming, and till it is restored to a state of security, it is quite useless to think of any extensive reparation of other parts of the building.

The western piers consist each of two portions, the parts toward the nave belonging to De Leia's work of the twelfth century, and those toward the transepts having been added after the catastrophe of 1220. Of these, the elder or western portions are literally, at least so far as they are open to examination, shattered to fragments, and the same process has extended itself in a less degree into the later or eastern parts of each pier; in fact, the only security which the tower has from actually falling, is the buttressing it sustains from the walls of the transepts and the nave, though the latter have themselves severely suffered under the undue pressure thus brought upon them.

The arch facing the nave is very much injured, and the wall which it sustains, up to the commencement of the latter stages, is utterly disintegrated; so much so as to render it dangerous very closely to investigate the defects; and the same state of disintegration extends itself some feet into the north and south walls, but especially the former, which is at this point crushed throughout its whole thickness.

It will be seen from what I have stated, that the whole remaining portion of the first tower is crushed and left at the mercy of the various walls which abut against, and so to speak, bolster it up; and that this terrible failure extends itself to a certain distance into the later, and, in themselves, better constructed portions; in fact, that of the four supports of the tower, two are sound, and two wholly untrustworthy.

The upper stages of the tower appear to be, in themselves, strong and substantial; but, being well supported towards the east, and ill towards the west, it naturally follows that a frightful crack runs up the north and south sides.

These cracks, however formidable they may appear, need not cause alarm as to the actual strength of those upper walls through which they pass; but, as sympathetic of the radical evil which exists below, they are only too significant. I need hardly say, that to remedy the tremendous failure which I have just described, will be a very difficult and very costly operation. It would be madness, in such a case, to attempt any repairs without the previous introduction of such a system of shoring, as would, if necessary, be capable of sustaining the entire load which now rests upon the damaged piers. It would be useless in this report to give any detailed description of such a system of shoring. I have, however, most carefully considered it, and, I believe, see my way pretty clearly to its construction.

The general course to be followed would be this:—

First, to bind together the walls of the upper stages of the tower with massive ties of iron, aided by stays of timber, so as to render it impossible for the walls to spread. Then to construct incompressible foundations, on which the shoring is to rest. Thirdly, to erect shoring of the most massive description under the north and west arches (the south arch remaining walled up as at present) and against the two western piers,—constructed on such a system (as before stated) as would be capable, if necessary, of sustaining the whole weight of that side of the tower.

After this would commence the operation of reconstructing, in a greater or a less degree, as may be found requisite, the two western piers. This would be done very gradually, and in small portions at a time, a moveable system of shores being used to sustain the work in immediate contact with the parts operated on, and capable of being shifted from time to time as the work rises. In this manner one pier, with the walls immediately insisting on it would be repaired (indeed in a great measure reconstructed), and then the other would be undertaken in a similar manner, the main shoring remaining untouched till the entire work is accomplished.

This operation, I may mention, has been successfully performed in several instances, as at the cathedrals of Hereford and Bayeux; at Sherborne Minster; at the churches of St. Mary at Nottingham, St. Mary at Stafford, and at Aylesbury. The structural defects in the upper portions of the tower will be readily repaired when the supporting piers and arches have been rendered substantial."

At a meeting of the building committee, on the 23rd ult., it was reported that 8,309*l.* had been subscribed by 137 persons. There were four tenders produced, as follows:—

Names of Contractors.	First Division.	Second Division.	Third Division.	Fourth Division.	Total.
Pollard	8,468 0	2,129 0	2,883 0	510 0	13,990 0
Hood & Son	9,550 6	2,355 14	3,363 19	544 0	15,813 19
Williams	10,238 19	2,472 16	3,442 11	485 4	16,639 6
James & Price	10,476 0	2,921 0	3,602 0	385 0	17,384 0

The first division comprised the lower part of the tower and the choir.

The second division comprised the upper part of the tower.

The third division comprised the choir aisles and the choir arcades.

The fourth division comprised the dry areas and drains.

Mr. Pollard's tender was accepted, with an instruction to complete the first and fourth divisions before proceeding with either of the other two divisions. The meeting resolved that the work should be commenced at once.

It is hoped that all friends to the restoration of the mother church of Wales, and of one of our noblest cathedrals, will lose no time in sending a subscription.

MEMORIAL TABLETS, LONDON HOUSES.

PRESERVATION OF SITES.

One of many correspondents on this subject writes,—Amongst notable residences let me remind you of the house where Milton resided in the latter period of his life in Petty France, Westminster. In an upstairs parlour in this house, overlooking St. James's Park, he wrote the last books of "Paradise Lost." It became the property of Jeremy Bentham, who placed a tablet over the door, with this inscription,—"Sacred to John Milton, Prince of Poets."

It is pleasant to read in your pages the notes of acquiescence which come in favour of a suggestion which has been so long since urged in the *Builder*. In the best of causes it is generally a difficult thing to move public opinion in its favour: it requires a strong force to put a large ball into motion; but the impetus once gained, the onward movement is comparatively easy: so it is hoped it will be in connexion with the subject which you now advocate. Just now twenty earnest persons banded together for the purpose of carrying out a system of marking the London houses of eminent men and *women*, would soon have the strength of their force increased, and a sufficient revenue at their disposal for carrying out any useful purpose.

Worthy as is the task of noting the houses of famed personages, the attention of such a society as you have hinted at might be well directed to the marking of the sites of buildings, &c., which, having a historical or other interest, have long since passed away. Why, for instance, should there not be placed on the old gateway of St. John's-square, Clerkenwell, not only some particulars of the *Gentleman's Magazine* (the most venerable of our monthly magazines), and of Dr. Johnson's connexion therewith, but also that "on the site where the modern houses to the north of the gate stand, there existed, in days gone by, the stately palace of the once powerful and wealthy order of the Knights of St. John of Jerusalem?" Scores of other sites might be mentioned, the marking of which would give a rare interest to many of the metropolitan thoroughfares. But besides these matters there is another duty which the society of the present generation owes to the next and succeeding ones, *and this is to endeavour to preserve the historical land-marks which now exist.* Within the boundaries of the City of London there are many stone marks of very great interest, which, without any effort being made for their preservation, are rapidly passing away from the view. A number of these are most interesting records of the Great Fire of 1666, and of important events of various dates. The variety of those stone records is as great as is their growing curiosity. The *Builder* has referred to several of these, but many more old historical land-marks should be attended to. The very circumstance of a society being established for the preservation of these things, would move even corporate authorities to do their duty.

Such a society as is shadowed forth, but which it is hoped will soon become a substance, would also affect the custodians of churches, chapels, &c., in which are inscriptions which cannot be well made out. In consequence of the want of attention to keeping clean the particulars of these bequests, the poor are often cheated, and the intentions of kindly hearted individuals frustrated.

Besides, if we in London set an example in this way, there is the hope that throughout the provinces there may be a spirit of the same kind shown, and that in large towns notes of famous interest may in the same way be preserved. There is more than I can say will come to your mind in connexion with this subject; but in conclusion I would suggest, that, notwithstanding the claims upon your time, you might be willing to act personally in connexion with this movement.

A London Wayfarer.

SANITARY MATTERS.

Grantham.—The report of Dr. Bristow, the Government inspector, sent down to Grantham, a short time ago, was read by the town clerk at a recent meeting of the council. Dr. Bristow alludes to complaints, made by some inhabitants of the town, as to the water, the quality of the gas, and drainage. He considers that when the water was pumped from the river it may have been injurious, but that on his visit it was of good quality. He attributes the fever which prevailed before he came to the state of some of the cesspools, but states that the evil had been abated by the means adopted for the purpose. He recommends the adoption of the Local Government Act, or the adoption of the Board of Health Act; and that Spittlegate and Little Gonerby should unite with Grantham in carrying it into effect.

Whitehaven.—Mr. Hawkshaw's delay, says the local *Herald*, in forwarding the plans and specifications for the sewerage of Whitehaven, has induced the trustees to pass a strong resolution; and the writer then goes on to say:—"Though we confess to a feeling that we should not now like to see the streets of a town which is veritably 'built upon one great midden' opened up until the fierce dog-heats and damps of autumn are passed, yet we would urge upon the trustees the propriety of having all ready to begin the work as soon as may be advisable. The fever of last year still hangs, we regret to learn, over the whole union, though not in an epidemic form; and the Board of Guardians, at their meeting on Thursday, prudently resolved to issue placards, calling upon the public to see to the removal of all nuisances, and informing them how to proceed about it. We hope the Trustees' Sanitary Committee are directing their attention to the same thing in town."

Dronfield.—A correspondent of the *Sheffield Independent* requests liberty "to call the attention of that slumbering body, the Dronfield Local Board of Health, to the fearful state of the town for the want of water. The chief supply is depending upon one well; and during the four-and-twenty hours it is never without watchers, waiting for a supply, which has to be ladled out, often mixed with mud. The Board has much to answer for, on account of this great want of one of the most essential necessaries of life; and is responsible, inasmuch as it could have been prevented, had the necessary duties, which called that Board into existence, been performed. The town has been taxed and rated, but its present state will show that nothing has been done. The

people, without exception, regret the Act which gave them a Local Board."

Rotherham.—The inhabitants of this town, who, with new water-works, have suffered so much from want of water, have now every reason to hope that the works which are to bring into the town an abundant supply, will soon be commenced. The supplying of the pipes has been entrusted to the Stavely Iron Works Company. The contract of Messrs. Chadwick & Thirlwall, builders, Masbro', for constructing the reservoirs, excavating the trenches, &c., has been finally accepted. The Board of Health have succeeded in making arrangements for the possession of the land through which the pipes will pass, and the money required for executing the works has been obtained. The contemplated scheme promises a more plentiful supply of water than was at first anticipated. Cases of fever, however, especially in the neighbourhood of the Holmes, and other densely-populated parts, are, meantime, again becoming numerous, and doubtless will become more so should the present hot, dry weather continue. It is hoped the present board will use every exertion in pushing forward a scheme which promises to do so much for the cleanliness, health, and comfort of the inhabitants of the town.

Wallsend.—The inhabitants having determined on applying the provisions of the Local Government Act to their township, the necessary preliminary arrangements were taken; and a meeting for the purpose of settling the boundaries of the district has been held, Mr. Morgan, the inspector appointed by the Home Secretary, being present. The petitioners were represented by Mr. Hodge, of Newcastle: Mr. Kewney appeared on behalf of those who opposed the introduction of the Act. After the views of both parties had been set forth, it was agreed to endeavour to obtain the sanction of Sir George Grey to an arrangement that the whole of the township should be included in the boundaries.

Sevenoaks.—Few towns in England, with a greater need for a supply of water, have it yet more abundantly around them than Sevenoaks, and frequent unsuccessful attempts have been made to bring it into the town. A new company is now being formed to supply this necessary want, with a capital of 12,000*l.*, more than half of which has already been raised, and the directors only ask for two-thirds of the amount to commence with. The water is to be raised from a shaft connected with the tunnel on the new South Eastern Railway, the water, of which there is a most abundant supply, now running to waste. It has been analysed and found, it is said, to be of an excellent quality. The directors hold out the inducement of a 6 per cent. dividend to shareholders.

CONTINENTAL NEWS.

Vienna.—The cross which is to surmount the spire of St. Stephen's Cathedral will be fixed, with great ceremony, on the 15th of this month. We have already adverted to the enormous finial which is now being put up, and which measures 15 ft. across. The ball and cross which will surmount this finial are being manufactured at the works of the Southern Railway. The former consists of eight pieces of wrought iron, rivetted together, over which is laid a thick covering of copper: it is 3½ ft. in diameter, and weighs 12 cwt. The cross weighs 3 cwt. Before the present restoration the tower and spire rose to a height of 439 Vienna feet (455 ft. English), but now an additional height of 15 ft. has been gained, whereby it obtains the first place, in point of height, amongst the towers of Europe. Strasbourg is 466 ft.: Ulm would have been 491 ft. high, but was never finished.——The committee appointed to inquire into the proposed scheme for building new Houses of Parliament has given its opinion in favour of two separate buildings. They advise the erection of the upper house on what is called the Burg-ring, near the barracks of the Hungarian Guard, whilst the lower house is to be built opposite the Opera House. —— The Vienna Society of Arts has collected 15,000 florins for the purpose of ornamenting the Elizabeth Bridge with statues; but it is stated that 7,000 florins more will be required, making a total of over 1,800*l.* The stone chosen for the eight figures to be placed on this bridge, was taken from the quarries near Pola, in Dalmatia, and is now being worked by various Vienna artists.

Berlin.—Already the late success (?) of Prussian arms has produced a work of art intended to commemorate the Danish campaign, Schultz, a sculptor, of Berlin, having composed a group which will probably find a place in one of the parks. The subject is Borussia seated, and crowned by Victory. On either side are two warriors, sheathing their swords.——The new Orangery at Sanssouci is about to receive twelve marble statues, 8 ft. high, representing the months of the year.

Munich.—Mr. Schnorr von Carolsfeld, director of the Royal Academy of Painting at Dresden, has received the commission to finish the remaining frescoes in the Nibelungen galleries of the Palace at Munich.——The public subscription for the national monument to the late king had reached 16,000*l.* at the end of May.

Stuttgart.—The budget for 1864 contains an item of 66,000*l.* for the purpose of erecting a public library, and strong rooms for state papers. The sum was granted without opposition.

Holland.—At Valkenburg, between Aken and Maastricht, in Holland, the remains of an ancient camp have just been discovered. The work of excavation is being carried on systematically and with vigour, and has already led to some important results of antiquarian interest. A number of human bones, Roman helmets, swords, and other arms, have already been brought to light. Amongst the articles discovered is a valuable ring of massive gold, ornamented by a large ruby.

Gotha.—The first stone of the new museum was laid on the 9th of July. It is expected that the building will be completed in three years.

FROM SCOTLAND.

Perth.—Her Majesty will inaugurate the colossal statue of the Prince Consort, which is now nearly ready to leave the hands of the sculptor, Mr. William Brodie, R.S.A., Scotland. The statue, which is 9 ft. in height, is carved out of a single block of freestone from Redhall Quarry. It will stand upon a pedestal 13 ft. high, the total elevation being 22 ft. The site is on the North Inch, at the west end of the bridge—one of the most prominent and favourable in the town. The statue represents Prince Albert as attired in the robes of the Order of the Thistle. The right hand, which rests on a square-shaped column or pedestal, holds an open scroll, on which is traced an elevation of the Great Exhibition Building.

Selkirk.—Though for a year or two past no unusual activity has characterized the building trade here, there has been nothing like slackness either. The new bank of the British Linen Company, though somewhat ill situate, being only seen to advantage in front, has improved the appearance of the Market-place. Several of the old-fashioned houses have been taken down and replaced by new and better ones, particularly at the east end of High-street, the Back-row, and in the West Port. Then there are the waterworks for supplying the town with water; and there are to be alterations upon the county jail, estimated to cost about 1,100*l.*; a new burgh school, at a cost of about 600*l.*; and alterations on the parish school, at an expense of 200*l.*

Inverness.—New accommodation has been provided for the volunteer force of Inverness by the completion of the alterations and repairs on part of the old buildings at the citadel with the view of converting them into suitable barracks for the use of the artillery battalion. Many of the stones of which the walls of the building are composed are supposed to have been the last few remaining exposed of the ruins of Cromwell's fort erected on this site in 1652-7, and demolished at the time of the Restoration. The internal arrangements of the building comprise a lofty drill-hall, 62 ft. by 21 ft., and above a large armoury, with reading-room, to be supplied with periodicals for the constant use of the members of the force. Other small rooms are attached for the storing of material, and house accommodation is provided in the building for quartermaster and drill instructor.

Elgin.—The plans for the new court-house, prepared by the Messrs. Reid, architects, Elgin, having been formally approved, a meeting of the county was summoned for the 25th July, for authority to be given to enter into a contract for the construction of the works. The estimated expense is about 6,000*l.* The Treasury, before which the offers have been laid, recommend, that the estimate of Mr. Stewart, of Peterhead, is the one which the Treasury recommend shall be adopted for the whole of the works. Mr. Stewart is completing the Banffshire Lunatic Asylum, and has also the contracts for the Elgin Union Poor-House, and executed the recent additions to the Aberdeen University. The local *Courant* says,—The new buildings are in the Italian style of architecture, and will stand to the east of the present court-house, with its front to High-street. They will also have another front to the east—towards a new street which it is proposed to open up from High-street to Greyfriars'-street, and in a line with the Abbey-street, which will form a direct communication from the County Buildings to both the railway stations. The front of the new building to High-street, to the level of the second floor, will be rusticated ashlar, relieved with mouldings; and immediately above the first plinth, in the central part of the building, there will be a set of eight Ionic pillars, with cornice and full entablature, surmounted by sets of enriched vases. In both sides of this central part of the building the windows are to be furnished with architraves and ornamented capes, having cornices over them corresponding with the cornice of the central part. The front to the proposed new street will be all of dressed ashlar, but plain.

IRELAND.

In Upper Sackville-street, Dublin, extensive wine stores have just been commenced for the Messrs. Gilbey & Son, the front of which, when completed, will be conspicuous. They consist of two dwelling-houses of considerable size, occupying together a width of about 60 ft.: the total depth from front to rear will be about 196 ft. The style of the front is Italian, but of a character in the treatment which is peculiar to the office whence this design emanates, exhibiting great freedom in the treatment of the details. The materials in the front will be picked yellow stocks, with limestone dressings: foliated flat ornament will be introduced on the windows and strings. Mr. W. G. Murray, of Dublin, is the architect. The probable cost is over 4,000*l.*

The Archbishop of Dublin lately consecrated a new church at Greystones, in the county of Wicklow. It is in the Early English style. The means available necessitated plainness of character. It is built of limestone, with open timber work in the roof, which, together with the seating, &c., is stained and varnished. The design was furnished by the architects to the Ecclesiastical Commissioners.

Mr. Dunville, J.P., of Richmond Lodge, county of Down, having lately lost a sister by death, is anxious to raise a tribute to her memory, and has undertaken to allocate the sum of 10,000*l.* towards improving the dwellings of the working classes in Belfast, and otherwise benefiting them both physically and educationally. Houses of a better description than ordinary, and of approved sanitary construction, will be erected, and let at fair average rents. This property will, it is believed, under good management, yield a reasonable rate of interest on the investment, and thereby farther promote the building of improved dwellings for the working classes. The trust fund, and all property connected with it, are to be invested in trustees, who are to purchase land within the extended boundary of Belfast, and to "build thereon, say 60 to 100 houses" of the description mentioned, the annual income from which may be calculated at 500*l.* a year, or upwards. A portion of this income is to be "applied, within the extended boundary of Belfast, to the promotion of the recreation of the working classes of Belfast," by means of athletic and other invigorating exercises, and also for the cultivation of music amongst working men.

The contract has lately been signed for the erection of a coast-guard station at Upper Cove, Kinsale, to accommodate 8 boatmen; having also a chief officer's house, a watch-tower, and a boat-house. The cost is 2,150*l.* The plans, &c., were prepared at the office of public works; Mr. Kenefick, builder.

County Carlow.—A country mansion has lately been completed at Mount Wolseley in this county for Mr. J. W. Wolseley, in the Classic style; and, from the ingenuity of the planning, is attended with an effect exceedingly picturesque. The apartments are of good size and proportion; the decoration of a refined character. The cost is about 6,000*l.* Messrs. Lanyon, Lynn, & Lanyon were the architects. Mr. Faircloth was the builder.

CHURCH BUILDING NEWS.

Little Amwell (Herts).—Since the erection and opening of the little church at Hertford Heath, a new transept has been erected by Mr. H. Norris, at a cost of 200*l.*; and stained glass windows, by Messrs. Hughes & Ward, of London, have been placed in the transept and in the apse. Texts have been inscribed over the chancel arch and in other parts of the building. An organ has been placed in the transept. The organ is of small size, the frame of stained oak, and the pipes gilt. The organ, which cost 150*l.*, is by Mr. G. W. Walker.

Bedford.—At a recent meeting of the restoration committee of St. Paul's Church, it was unanimously resolved to consult Mr. G. E. Street, architect, as to the present security of the tower and spire of the church, and the practicability and advisability of so raising and widening the tower arches as to unite in a proper and stable manner the nave with the chancels.

Boxgrove (Sussex).—The Priory Church is now in course of restoration, under the superintendence of Mr. Scott. Apart from re-seating and warming the church, the task is mainly that of removing deformities and securing stability. The Duke of Richmond, the vicar (Rev. W. B. Burnett), and the parishioners have contributed to the work; but, to effect everything designed, an additional sum is necessary.

Boston.—The preparations for the erection of the new church of St. James, in George-street, have at length commenced. The work, which has been let by tender, has been given to Mr. R. Ranyell, builder. The amount of his tender, which does not include floors and fittings, is 2,616*l.* The other tenders sent in were,—Mr. Sherwin, 2,895*l.*; Mr. Baker, 2,990*l.*; Mr. Whitworth, 3,050*l.*

Hunslet.—On the site of the old church of St. Mary, in Hunslet, but extending much beyond the original boundary, an entirely new edifice has been erected, and was recently consecrated by the Bishop of Ripon. The cost of the new building has been nearly 8,000*l.*, including everything, and all the necessary funds have been provided by Mr. Ingham, of Palermo, and his two sisters, excepting 1,300*l.*, which have been subscribed by parishioners and their friends for the especial purpose of purchasing land to be added to the former site for building a boundary wall, and providing an organ, peal of eight bells, and clock. The church is built of broached sandstone, is in the Geometric style, and consists of chancel, nave, north and south aisles, transepts, south porch, organ chapel at the south side of the chancel, vestry at the north side of the chancel, and tower and spire at the north-west end of the north aisle. The tower is 20 ft. square and 72 ft. high, with spire 84 ft. high; making the entire altitude of tower and spire 156 ft. The tower contains a clock with three dials and a peal of eight bells. The chancel is 31 ft. by 21 ft., and 33 ft. high; nave, 86 ft. by 22 ft., and 48 ft. high to the apex of the roof. It is divided from the aisles and transepts by six arches on each side, supported by clustered shafts, with carved capitals. The north and south aisles are respectively 12 ft. wide and 24 ft. high, and the two transepts are 30 ft. by 26 ft., and 42 ft. high, with double gables, each containing a three-light window with tracery heads. Over the nave arcading rises a clerestory, with a three-light window in each compartment. The east window is of five lights, and the west window of six lights, with elaborate tracery. Both are filled with stained glass, by Messrs. Clayton & Bell, of London. The nave roof is open to the ridge, and formed with curved ribs resting upon hammer-beams, supported by shafts and carved corbels. The chancel roof is boarded under the collar by beams of an hexagonal form, divided into panels by small moulded ribs, and enriched by an embattled cornice. The whole of the roofing is stained and varnished. The pewing is of stained deal. The church floor is laid with encaustic tiles, by Messrs. Minton & Co. The reredos and font are of Caen stone, executed by Messrs. Burstall & Taylor, of Leeds, who have also done the whole of the stone carving. The church is lighted by gas, by twelve coronæ suspended by the roof timbers, these being supplied by Messrs. Peard & Jackson, of London. The church will accommodate 856 persons, 528 free. The building has been erected from the designs of Messrs. Perkin & Backhouse, of Leeds, architects. The organ, which cost about 600*l.*, has been supplied by Messrs. Conacher & Co., of Huddersfield; and the other portion of the work has been executed by the following contractors: Masons' work, Mr. J. Hardwick, Hunslet; joiners' work, Mr. Wm. Britton; slaters' work, Mr. J. Lawson; plumber and glaziers' work, Mr. Thomas Bedford; plasterers' work, Mr. J. P. Mountain; painters' work, Mr. Wm. Nelson; ironfounders' work, Messrs. Singleton & Tennant, Leeds.

Jarrow.—Lady James has offered to take upon herself the restoration of the chancel and tower of the church of Jarrow, an offer which has been accepted. The exertions of the committee will now be confined to the obtaining of funds for the nave—the amount still to be raised being about 1,500*l.*

DISSENTING CHURCH BUILDING NEWS.

Dalston.—The foundation-stone of a new Wesleyan chapel has been laid, in Mayfield-terrace, Dalston, London. The building will include, besides the chapel, a school-room, 13 ft. high and more than 50 ft. square; four good-sized class-rooms for church purposes; a committee-room, and three rooms and offices constituting a chapel-keeper's residence, besides the chamber and fuel-store for the heating apparatus. The chapel will seat altogether 1,277 adults, and will have on the same level a minister's vestry, with dressing-room, &c., attached. The plan comprises a nave with an apsidal projection at each end: that at the back, or east end, is semi-octagonal, and forms the chancel, and that at the front or west end, is semicircular at the end, and contains all the entrances and staircases. Having school and class rooms below, the chapel is necessarily elevated above the street level. The main building is divided into five bays, and the gallery, which is three pews deep, is stopped at the east end with a cant, so as to leave a complete bay on each side of the chancel without any gallery, giving somewhat the effect of a cruciform arrangement, with the gallery sloping at the end of the side aisles, and leaving the transepts open. The design is Gothic of the Early French character, freely treated, and with some elements of the modern eclectic school, rendered in the simplest and most available materials, viz., picked yellow stock brick walling, relieved with bands, arches, &c., in blue Staffordshire, black and yellow malms, Bath stone dressings, with a few sunk columns in red Mansfield. The main building is covered with blue and red Bangor, in bands, and the staircase apse with Witland Abbey slates. The roof is constructed with principals and intermediates, formed with rafters, cross-braces, and iron tie-rods, and king-bolt, with cast heads and shoes, and divided into panels about 6 ft. by 5 ft. by purlins. The chapel, school, and class-rooms can be warmed either together or separately, by hot-water apparatus. The contract, which is inclusive of warming, ventilation, gasfitting, and boundary-walls, has been taken by Messrs. Dove, Brothers, of Islington, at the sum of 4,135*l.* The architects are Messrs. Bassett, Keeling, & Tyrie, of Gray's-inn, whose design was selected in a limited competition with six others.

Worcester.—The Baptist Chapel, in Sansome Walk, has been opened for divine service. The chapel is in the Middle-Pointed style. Its form is that of a cross, and the interior arrangement comprises a nave, aisles, and transept—the pulpit being in the centre of the transept—with a gallery for the choir, and vestries underneath, behind the pulpit in the head of the cross. The aisles are divided from the nave by arcades constructed of slender cast-iron columns, having floriated roof and wood arches. The columns are painted a deep blue, relieved with gilding at the capitals. The roof of the nave is open two-thirds of the way up, the wood arches, which are slight and numerous, coloured dark oak, and contrasting with the white spaces of the roof seen between them. The woodwork throughout is stained dark oak varnished. The windows are glazed with amber-tinted glass; and in the head of the cross, behind the pulpit, there is a four-light double trefoil window of stained glass. Exteriorly the walls are of a dark bluish brown stone, rough on the face, and laid in irregular courses; while all the groins, windows, doors, pinnacles, &c., are of a white Bath stone. At the front, rising from the bay on the left hand, there is a tower and lantern spire, rising to the height of 110 feet. The tower rises with a gentle slope inwards, perfectly plain, and then breaks into an open square lantern, having arched lights and slender shafts, and is surmounted by a tapered spire finished with a gilded metal finial or vane. There is a considerable amount of ornament, carved in stone, about the spire, the great front window, and over the buttresses; and the building, with the ground on which it stands, is enclosed by a low stone wall, with pillars, and in the intermediate spaces an iron railing. The site is in an open locality, close by the pleasure grounds. The chapel is seated to accommodate 800; and galleries can be added along the sides of the nave without interfering with the design. The plans were by Messrs. Prichett & Son, of Darlington; and the building has been erected by Messrs. Wood & Son, under the superintendence of Mr. Johnson, of this city. On the vacant space of ground at the back it is intended hereafter to erect schools

Montgomery.—The plans for the new Wesleyan chapel here, we understand, were prepared by Mr. W. H. Spaull, architect, of Oswestry.

STAINED GLASS.

Llanymawddwy Church (Merionethshire).—A stained-glass window has been set up in the chancel of this little church. The figures are, the Saviour, with the Agnus Dei; St. Tydecho, the founder of the church; and St. David, the patron saint of Wales. The inhabitants are indebted for this to Mr. E. Buckley, of Bryn and Plas Dinas, Baron of the Lordships of Mawddwy. Mr. Buckley had previously contributed largely towards the restoration of the church.

York Guildhall.—Shortly after the death of Mr. Ald. Meek, the City Council resolved that a subscription memorial window to the deceased should be placed above the Sessions Court in the Guildhall, to supersede the stained glass window there situate and designed by Gyles, a citizen of York. A design for the new window was prepared by Mr. F. Bell, of York, architect, and the tender of Messrs. Hardman & Co., Birmingham, was accepted for the execution of the work. The new window has now been put in. The stained glass of the old window will be shortly placed in one of the side windows of the Guildhall. The stone-work of the old window was in a very dilapidated state, and new mullions and tracery were fixed before putting in the glass. The fact prominently represented is the granting of the charter by Richard II. on the 18th day of May, 1396, and in the 19th year of his reign. By this charter his Majesty confirmed all the former charters, rights, and privileges of the city, and formed the city into a county by itself. The centre light of the window contains a full-length figure of Richard II., his left hand resting on the mace, "which he had before given to the Mayor," to use the words of Torr. On the right hand of Richard II. is William de Selby, who was Mayor for the third time in 1388-89, and was the first Lord Mayor. He is represented as having just received the sword. On the King's left is the figure of Sir William Frost, knight, who was the Lord Mayor in 1396-97, when the great charter of the city was granted; and is represented as just having had the document presented to him. The extreme right and left lights of the window have figures of the first two city sheriffs, namely, John More and Thomas Howden, and are holding books to indicate the law. All the figures are represented in the costume of the period of Richard II., in their gowns of office, and with beards and hair as worn at that time. They are placed under canopies, and on diapers of the same period as the architecture of the Guildhall. In the tracery are the arms of Richard II., with the crown, crest, cypher, cognizance, and supporters; the arms of the city of York, backed by the sword and mace, and surmounted by the Spanish hat; and the city arms as before impaled with those of the late Alderman Meek as Lord Mayor. The lower part of the window is filled in with the arms of five of the witnesses to the charter.

St. Peter's, Newcastle.—This place of worship has received another stained glass window, executed by Messrs. Hardman, of Birmingham. The window is a memorial one, and the subject introduced is "Christ Blessing little Children." The window has been erected by Mr. M. C. Woods, in memory of his little boy, and fitted up by Messrs. Lawson & Sons, of Newcastle.

Berwick Parish Church.—An addition is about to be made to the number of stained glass windows by the churchwardens, who find that the funds, aided by a subscription amongst themselves, will allow of the renewal of the window on the west side of the south door. The work will be done in a plain style, and it has been entrusted to Mr. Ballantyne, of Edinburgh.

THE BUILDING TRADES' MOVEMENT.

Manchester.—The carpenters and joiners at Manchester have given the employers notice for an advance of wages.

Darlington. — The bricklayers' labourers of Darlington have given notice to their respective employers that on and after August 1st, they demand a rise of 1s. per week in their wages. They have hitherto been paid at the rate of 20s. per week.

Paisley.—There is a strike among the masons at Paisley. The only difference is as to whether the men should go to the masters to receive their pay or the masters should go to them at their work. Their demand for an advance had been conceded.

COMPETITIONS.

Chester Town Hall.—At a special meeting of the town council, and on the recommendation of the committee, the premium of 100*l.* was awarded to the author of the design marked "Love's Labour;" and the premium of 50*l.* to the author of the design marked "Deva," as suggested by Mr. Digby Wyatt, provided the authors could guarantee that their designs could be adopted for the sum named by the council (16,000*l.*), or thereabouts. On opening the letters accompanying the designs, it was found that the author of "Love's Labour" was Mr. W. H. Lynn, Belfast; and of "Deva," Mr. E. H. Heffa, of Liverpool.

Walsall.—The mayor and corporation have lately printed and issued conditions to be observed by architects sending in designs for a town hall and gaol, from which precious document I extract two paragraphs:—

1st. "The council will not be bound to adopt either of the designs to which premiums shall be awarded, nor any other design; nor to employ the competitor to whom either of the premiums shall be awarded; but the premiated designs shall become the absolute property of the council, who may make use of them as they shall think fit."

2nd. "The designs, including full and detailed specification, must be delivered at the office of the town clerk," &c.

This plainly speaks for itself; and I have only to add that the premiums offered are not 500*l.* and 300*l.*, but 50*l.* and 30*l.*

AN ARCHITECT,
who will not trust himself to the justice of the worthy Mayor and Corporation of Walsall.

Books Received.

VARIORUM.

"Holiday Papers. By Harry Jones, M.A. London: Hardwicke, 1864." Some of these popularly-written papers, by the incumbent of St. Luke's, Soho, appeared in *Chambers's Journal*, *Once a Week*, and the *Leisure Hour*. They are both amusing and instructive. Not a few of them are on subjects in natural history, such as on "Our Feathered Visitants," on "Bird-murder," "Larks," "Rooks," "Starlings;" on "Dogs I have Known," &c. There is a great variety, however, of subjects, such as "Dreams," "Association," "Sight-seeing," "Nursing," "Sea-side Life," "Mobs," &c. In one on "The Language of Flowers," the silly affectation of ultra-learned names is thus justly and ably ridiculed:— "Can you picture to yourself a man going a-wooing with a 'Delphinium Donkelærii' in his button-hole? Don't you think snapdragon hardly an august enough translation of 'Antirrhinum Caryophylloides'? No humble bee would venture to show its nose in an 'Indigofera-coccinea endecaphylla;' and I should like you to tell me, off hand, what a 'Guiterezia gymnospermoides' smells like, or a 'cucumus aradac.'"——"Letter to W. P. Andrews, Esq., Chairman of the Euphrates Valley Railway, on the Importance and Necessity of the Establishment of the Euphrates Route. By Captain W. B. Selby. London: Allen & Co." The very important subject of the Euphrates Valley route to and from India is ably treated of in this pamphlet, which no one, we should think, can read without being convinced of its great advantages over the old route by the Red Sea. Politically as well as commercially the scheme is a most desirable one; and the Government are fully alive to its advantages. Had such a route existed during the Crimean war and during the Indian rebellion it would have greatly aided our military power; and in a commercial view the cotton famine would have been considerably mitigated by it. The commercial advantages to Persia and Turkey also, as well as to India and this country, would be great and mutual by the opening of such a route. The Arabs, it appears, are favourably inclined to it as an English project, though they would oppose it were it Turkish in its origin.

Miscellanea.

THE ADMIRALTY.—We understand that Colonel Godfrey Thomas Greene, Director of Engineering and Architectural Works at the Admiralty, has resigned the appointment which he has held for many years.

DESTRUCTION OF A LONDON CHURCH.—The parish church of St. Clement Eastcheap, situate in St. Clement's-lane, King William-street, is to be destroyed, an arrangement having been made under the Union of City Benefices Act, and with the sanction of the Bishop of London, for uniting the parish with that of St. Mary Abchurch.

THE LUDGATE-HILL VIADUCT.—An accident has taken place on Ludgate-hill. Several workmen were engaged in raising one of the iron girders, when unfortunately the chain broke, and the girder fell. Several of the workmen sustained severe, and, in one or two cases, it is feared, mortal injuries.

PROPOSED PUBLIC PARK FOR HANLEY.—At a public meeting, called by the mayor on a requisition of upwards of 800 of the inhabitants, for the purpose of considering this subject, appropriate resolutions have been passed promotive of the formation of a public park, and requesting the town council to obtain ground for the purpose. The sum contemplated as requisite is about 8,000*l.*

ALBERT MEMORIAL AT LICENSED VICTUALLERS' ASYLUM.—The memorial statue of the late Prince Consort in the grounds of the Licensed Victuallers' Asylum, Old Kent-road, will be inaugurated on the 9th instant by the Prince of Wales. The figure is of Carrara marble, and is upwards of 8 ft. high, the pedestal on which it rests being a block of Sicilian marble, the weight of which is ten tons, and its height a little over 6 ft.; the whole standing upon a granite base of 1½ ft. in thickness. The Memorial itself is, consequently, little short of 16 ft. in height. His Royal Highness is represented in the costume in which he appeared when laying the foundation stone of the Albert Wing: one hand is resting on a part of a Corinthian column: the other holds a scroll. The whole was designed and executed by Mr. Thomas Earle, of Brompton, at a cost of between 600 and 700 guineas.

THE PRINCESS'S THEATRE.—Some very remarkable scenery has been prepared by Mr. F. Lloyds, for "The Streets of London," a sensational melodrama, arranged by Mr. Boucicault, which has been produced at this theatre with great success; notably a view of Charing-cross, after a fall of snow, including St. Martin's Church, Northumberland House, Parliament-street, and the gas-lamps, all built up and painted in the most effective and clever manner. Cabs pass and repass at a distance. The usual frequenters of the streets in the evening give additional force to the deception. Of its kind it is one of the best things that has been done, and the same must be said of the representation of a house on fire, which closes the second act. These scenes alone should draw visitors for a long time to come; moreover, the piece is very interesting, and Mr. G. Vining acts with unflagging vigour.

THE OPENING OF HAMILTON-PLACE. — With reference to this subject, noticed in our last, a correspondence has been issued in the form of a return to the House of Commons, from which it appears that the Metropolitan Board of Works, in stating their opinion in a letter to the Chief Commissioner of Works, that the opening up of Hamilton-place into Park-lane would afford the readiest and most economical means of relieving that thoroughfare, remark that inasmuch as the proposition would affect property almost exclusively belonging to the Crown, it is one which can only be effectively carried out by the executive of her Majesty's Government. In reply, Mr. Cowper assures the Board that he desires to assist them so far as he can in any project they may adopt for remedying the evil; but reminds them of the inadequacy of Hamilton-place to receive the great and increasing traffic which encumbers Park-lane. In conclusion, the secretary says,—"If the Metropolitan Board should, on consideration, be of opinion that other alterations do not afford greater advantages than the prolongation of Hamilton-place, the First Commissioner would request to be informed, before entering further into the subject, whether the Board propose to take upon themselves the expense of the proposed improvement."

THE HOTEL MOVEMENT.—The half-yearly report of the Westminster Palace Hotel Company shows an available balance of 7,057*l.* 17*s.* 2*d.*, out of which a dividend at the rate of 8 per cent. per annum has been declared, leaving a balance of 1,857*l.* 17*s.* 2*d.* to the new account.

RIPON CATHEDRAL: DAMAGE BY THE WIND.—About two-thirds of the temporary screen erected at the west-end of the nave has been blown down. The accident was caused by the glass being out of the whole of the lower and two of the upper windows of the western front, which is now under repair.

NIGHT-CLASSES FOR DRAWING AT SOUTH KENSINGTON.—A minute of the Lords of Committee of Council on Education, drawn up in consequence of the report of the select committee of the House of Commons, promises an inquiry into the feasibility of establishing night-classes at South Kensington to teach drawing to persons who cannot attend established schools of art.

THE SARCOPHAGUS IN SOANE'S MUSEUM.—Mr. Bonomi has completed his drawings of the sarcophagus, and the work will be published immediately. The sarcophagus has been in the museum forty years, and now, for the first time, the curious writings on its sides and floor will be given to the world. We may then expect they will soon be deciphered by continental students or our own.

NEARLY TWO MILES OF FIRE.—A short time since a portion of the furze growing on Keston Common, in Kent, was wilfully set on fire, and it continued to burn in patches; but the recent high wind fanned the smouldering fires into other portions of the common, until at length the flames covered an area of nearly two miles. It was apprehended it might extend to the Fox Tavern, and also to some dwelling houses. One hundred men have therefore been employed to cut trenches, so as to prevent any further extension of the mischief.

THE SCHOOLS OF ART QUESTION. — At the interview which the deputation of managers and masters of schools of art had with Earl Granville, referred to in our last number, Earl Granville said that the system of payments on results must remain in force until the end of the financial year, as it would be impossible to introduce alterations until the next session of parliament—since the estimates for the present year had been based upon the system now in force.

NON-LIABILITY FOR STOPPING WATERCOURSE.—In the case of Roberts *v.* Rose the plaintiffs had obtained leave from the occupier and agent of the owner of certain land to make a watercourse over it. The owner subsequently leased the land to the defendant, who, as well as the agent of the owner, gave the plaintiffs notice to discontinue the watercourse. On their refusal the defendant stopped it at the place where it left the plaintiffs' premises, and it came upon the land of the occupier, and so caused damage. It was held by the Court of Exchequer, firstly, that the lease was a revocation of the licence; secondly, that the defendant was right in stopping it where he did, as the plaintiffs had failed to show that it could have been stopped elsewhere with less damage to themselves, to the defendant and the occupier, or any third person.

GOVERNMENT SCHOOL OF SCIENCE, CHESTER AND CREWE.—The students, under the care of Mr. Ellis A. Davidson, at the Chester and Crewe Science School, which has been recently grafted on the local school of art, have again been very successful in the science examinations, held in May last. In the subject of plane and solid geometry, fourteen schools of science have competed throughout the kingdom, and between them have achieved 246 successes, or an average of about 17½ each, whilst Chester takes thirty-three. Thirty-six students were presented from the Chester and Crewe schools, and thirty-three have been successful, thus contributing only three to the sixty-six failures which have taken place amongst the entire number of schools. Again, in mechanical and machine drawing, 154 successes are divided amongst twelve schools, or about 12¾ each, whilst Chester and Crewe take twenty-two successes. In building construction, four first-class prizes have been given throughout the United Kingdom, and of these Chester takes two. There have been two second-class, and Chester takes one of these: there have been thirteen third-class, and Chester and Crewe take three of them. Besides these, Chester and Crewe also take prizes for animal physiology and zoology.

Railway Traffic Returns.—The traffic receipts of railways in the United Kingdom amounted, for the week ending the 16th of July, on 11,335 miles, to 689,597*l.*, and for the corresponding week of last year, on 10,921 miles, to 617,677*l.*, showing an increase of 414 miles, and of 71,920*l.* in the receipts.

Fall of Cupola, Russia.—The recently-erected cupola of the Church of the Transfiguration of St. Petersburgh came down on the 18th ult. with a terrific crash. The loss of life would have been comparatively limited had not crowds of townspeople forced an entrance into the edifice beyond all control from the police or military in immediate attendance. The concussion created by the falling dome in a short time brought down the whole structure, overwhelming several hundreds in the ruin.

Progress of the Wesleyans.—At the recent conference in Bradford, it was stated that during the past eleven years nearly 59,000 members have been added to the societies, after filling up the vacancies occasioned by death and other causes. About 580 new chapels and 250 new schools have been built, at a cost of 746,000*l.*, and nearly 470,000*l.* of chapel debts liquidated. More than a million and a quarter of money has been raised for Foreign Missions, and the Home Missions have an increased annual income of 6,000*l.* The Theological Institutions have received augmented support, and more than 400 young men have been ordained to the work of the ministry.

Clifton Suspension Bridge.—The bridge, it is expected, will be open for traffic early in October. The foundation stone of the structure was laid on the 27th of August, 1836, by the Marquis of Northampton, as president, on the occasion of the meeting, in Bristol, of the British Association for the Advancement of Science. This year the association holds its meeting at Bath, in September, under the presidency of Sir Charles Lyell; and it would be an interesting addition to the proceedings of that body if the bridge could be opened under its auspices in 1864. Great progress is being made with the roadway. The framework of the bridge is being painted, and a portion of the railings for each side of the footpaths is in hand. The road leading to the bridge on the Leigh or Somersetshire side is finished, and that on the Clifton side is in a forward state.

St. Martin's-in-the-Fields.—The principal transaction preserved of Dr. Lloyd, as rector of this now densely populated parish of St. Martin's-in-the-Fields, was his negotiation with Richard Baxter for his meeting-house. Some curious traits of the times are revealed by it. Oxenden-street was then building; and Richard Baxter erected there a place of worship for the use of his sect, but found the speculation disastrous, for Mr. Secretary Coventry instigated the guards of Charles II. to come under the windows and flourish their trumpets and beat their drums whenever Richard preached. Finding that not a word he said could be heard, and that remonstrating with these gentry was dangerous, Baxter sought to dispose of the building. Dr. Lloyd kindly introduced the affair to the vestry of St. Martin's. By his mediation poor Baxter obtained the handsome rental of 40*l.* per annum for the building from the vestry, and it was forthwith consecrated as a "Tabernacle" to St. Martin's-in-the-Fields.—*Churchman's Family Magazine.*

Public Improvements in Preston.—At a recent meeting of the Preston town council, a motion was made to the effect that application be made to the Poor-law Board for an order authorising a further advance of the sum of 15,000*l.* under the Public Works Act. During the discussion which ensued, the town clerk stated that in August last year the corporation got authority to borrow 28,500*l.* The sum of 10,000*l.* was to be advanced at the date of the order, to be followed by further sums when needed. The 10,000*l.* named had been expended in block paving, flagging, improvements at the Ribble side, and alterations of corporate property. Relative to private improvement expenses, he observed that by an order dated 24th October, 1863, power was given to the corporation to borrow 19,739*l.* The order in connexion with this authorised an advance of 5,000*l.*, with the remainder to follow. The sum of 5,000*l.* had already been expended, and now it was thought desirable to ask for 3,000*l.* more. The council agreed to borrow the 15,000*l.* alluded to.

Chapel Royal, Savoy.—A correspondent suggests, that an opportunity is now afforded of bringing the Chapel Royal, Savoy, into public notice, by *not* rebuilding the house in the Strand, which was destroyed, but leaving an open space, and placing a flight of steps the whole width of the chapel, with an iron railing in the Strand, and a central gate.

The Materials of the Brighton Hotel.—Before the first brick was laid, 11,500 yards of excavation had to be carted away. There are 800 rods of brickwork, or 3,500,000 bricks; 12,500 cubic feet of York and Portland stone; 450 tons of wrought and cast-iron; 470 loads or 23,500 cubic feet of timber; 30 miles of flooring; an acre and a half of Minton's glazed tiles; a quarter of an acre of encaustic tiles; an acre of sheet and half an acre of British plate glass; 15 miles of paper-hanging; 13½ miles of bordering; 6 miles of gas piping; 12 miles of bell-wire, and 5 miles of tubing, in the building. In the hotel proper there are 260 rooms, containing 280 marble chimney pieces, and from the top to the bottom of the grand staircase there are 128 steps.

So much per Acre, how much per Yard? Divide the *pounds* per acre by twenty and the answer will be the price per yard in *pence, plus* one-tenth of a penny per each shilling; and similarly to find the price per acre, multiply the *pence* per yard (adding one-tenth of a penny for each shilling) by twenty, and the answer is the price per acre in pounds. Ex.—1,815*l.* per acre÷20 gives 90 pence per yard. The use of the above formula is when a quick answer is required, as in a sale room or otherwise, where the fractions may be disregarded, only bearing in mind on which side they lie. It arises from the accidental circumstance that the number of yards in an acre is within forty of the number of pence in a pound multiplied by twenty.—W. I.

Robin Hood.—At the Nottingham meeting of the Lincoln Diocesan Architectural Society, among the proceedings subsequent to our notice of last week, an interesting and curious paper by Mr. Planché, Rouge Croix, College of Arms, entitled "A Ramble with Robin Hood," concluded the proceedings in the Exchange Hall. Mr. Planché said he had pleasure in avowing himself a believer in Robin Hood, without holding "each strange tale" of that famous forester to be "devoutly true," or being fortunate enough to discover any very important fact in support of his opinion. He had satisfied himself that the objections of the dissenters are in no instance fatal, and that in many cases they were met by very singular circumstantial evidence. A good deal of this evidence Mr. Planché then went into; and in course of which he adduced the remarkable fact of the existence of a Robert Fitzooth, or Fitz Odo, of Loxley, in the reign of the second Henry. Indeed there was indisputable evidence, he remarked, of two Robert Fitz Odos or Fitzooths living in the twelfth and thirteenth centuries, the former of whom certainly, and the latter most probably, was lord of the manor of Loxley.

The Lenoir Gas Engine: "Steam superseded."—The engine invented by M. Lenoir, of Paris, under the auspices of the Imperial Gas Company of that city, and now in extensive use there, has been introduced into America, as appears from the *American Gas-Light Journal*, which thus describes it:—The Lenoir engine is in appearance and style very much like a horizontal steam-engine, having a cylinder, piston, crank-shaft, and fly wheel. The cylinder has the necessary slide arrangements for the admission of the gas (the ordinary city coal-gas, supplied from the service-pipes) and atmospheric air, in due proportions: the gas is ignited at the proper moment by the electric spark from a battery connected by wires to each end of the cylinder—the connexion being made and detached by the rotary action of the crank-shaft. The expansive force consequent on the ignition, gives motion to the piston on each side alternately. The cylinder has a water-jacket surrounding it, through which a stream of water is kept gradually flowing, to keep it cool. The engine, once fixed, the battery charged, and the gas turned on, it is ready for action at any desired moment, needing no engineer to superintend its working; and as soon as the work required of it is completed, and the gas shut off, the engine instantly stops, and the expense ceases. The daily cost of gas and chemicals is trifling, and there is no boiler and no chimney. It can be worked on any floor of a house, and almost under any circumstances.

Selsey: Pulling down the Oldest Church in the South of England.—It having been agreed at a vestry meeting, by the consent of about six of the ratepayers, that the old church of Selsey should be pulled down, and a new one built near the village, the following remarks are made by one of the inhabitants:—On the site where the church now stands was a place where the ancient Britons performed their religious worship, as witness the mount. On the south-eastern corner of the churchyard the Romans built their church, as witness old foundations if you dig below the surface. In England Christianity was first preached at Selsey, probably on the very site where the church now stands, and tradition says that one of the twelve apostles preached at Selsey. The site is one where religious service has been performed most probably for upwards of 2,000 years: can it be possible for the present generation to remove it! The church is the oldest church in the south of England, if not in England, and a few years since was put in good repair: at a trifling expense it would now last for ages.

Smoke-consuming Apparatus for Heating and Ventilating.—Lewal's patent apparatus for warming and ventilating large public and other buildings consists of a cold and warm air chamber, a coal and gas receptacle, a tank for water, and a number of tubes, and is placed in a brick chamber, which can be erected in the basement. The principal improvements claimed for this apparatus are,—that the smoke and gas generated by the combustion of the fuel are entirely consumed, thus increasing the heating powers of the apparatus without causing any additional consumption of fuel;—that no smoke being admitted into the chimney or flue, it is only required to cause the necessary draught of air to pass through the fire to promote combustion;—that by the constant passing through the apparatus of large quantities of pure warm atmospheric air into the building, a more healthy and better atmosphere is obtained;—that the apparatus being entirely surrounded by air the whole of the heat generated by the fire is absorbed in its passages through the pipes;—that the portion of the apparatus in which the heat is generated being surrounded by a jacket, the space between being filled with air supplied from the ashpit, the air passing into the building does not come in contact with red-hot surfaces;—that by having in the interior of the apparatus a tank containing water, which becomes heated, and gives off a small quantity of steam, the hot air absorbs it, and has thus restored to it the moisture of which it has been deprived in the course of heating. The apparatus has been erected in the new Congregational church of Pilgrim Fathers, in Buckenham-square, New Kent-road, Southwark.

TENDERS.

For residence, at Topsham, Devon, for Mr. E. B. Penny. Mr. W. F. Cross, architect:—

Kenshole	£2,414	0	0
Mauley	2,397	0	0
Periam	1,542	0	0

For City Offices, Clement's-lane. Messrs. F. & H. Francis, architects:—

Higgs	£20,967	0	0
Patman & Fotheringham*	20,613	0	0
Hill & Keddell	20,350	0	0
Mansfield & Sons*	20,300	0	0
Lawrence	19,722	0	0
Colls & Co.	19,474	0	0
Myers & Sons (accepted)	19,275	0	0
Hill & Sons†	17,600	0	0

* These tenders not delivered in time.
† This tender subsequently withdrawn.

For two semi-detached houses, at Barnet. Mr. T. W. Goodman, architect:—

Cushing	£1,100	0	0
Wood	1,050	0	0
Pocock	1,047	0	0
Stephenson	1,025	0	0
Peskett	997	10	0
Marshall	991	5	0
Hardiman	985	10	0
Ring & Warriman	965	0	0
Malley	950	0	0

For painting and sundry repairs to be done at No. 3, Mincing-lane, City. Mr. N. S. Josephs, architect:—

King & Sons	£233	0	0
Read & Son	229	0	0
Taylor	225	0	0
Foxley	224	0	0
Cohen	198	0	0
Young	187	0	0

For repairs, at the Pencutters' Arms, James-street, Lower Marsh, Lambeth. Mr. James Harrison, architect:—

Green	£120	0	0
A. & J. Smith	98	0	0
Haynes	79	0	0
Nind	61	15	0